

 $I(J^P) = \frac{1}{2}(0^-)$

D⁰ MASS

The fit includes D^{\pm} , D^0 , D_s^{\pm} , $D^{*\pm}$, D^{*0} , and $D_s^{*\pm}$ mass and mass difference measurements.

| VALUE (MeV) | EVTS | DOCUMENT ID | TECN | COMMENT |
|---|------------|------------------------|-----------------|---|
| 1864.6 \pm 0.5 OUR FIT | Error in | cludes scale factor | of 1.1. | |
| 1864.1 \pm 1.0 OUR AVE | RAGE | | | |
| $1864.6 \pm 0.3 \pm 1.0$ | 641 | BARLAG | 90c ACCM | π^- Cu 230 GeV |
| 1852 \pm 7 | 16 | ADAMOVICH | 87 EMUL | Photoproduction |
| $1861 ~\pm~ 4$ | | DERRICK | 84 HRS | e ⁺ e ⁻ 29 GeV |
| $\bullet \bullet \bullet$ We do not use the | e followin | g data for averages | , fits, limits, | etc. ● ● ● |
| 1856 ± 36 | 22 | ADAMOVICH | 84B EMUL | Photoproduction |
| 1847 \pm 7 | 1 | FIORINO | 81 EMUL | $\gamma N \rightarrow \overline{D}^0 +$ |
| 1863.8 ± 0.5 | | ¹ SCHINDLER | 81 MRK2 | e ⁺ e ⁻ 3.77 GeV |
| 1864.7 ± 0.6 | | ¹ TRILLING | 81 RVUE | e ⁺ e ⁻ 3.77 GeV |
| $1863.0\pm\ 2.5$ | 238 | ASTON | 80E OMEG | $\gamma p \rightarrow \overline{D}^0$ |
| 1860 \pm 2 | 143 | ² AVERY | 80 SPEC | $\gamma N \rightarrow D^{*+}$ |
| 1869 \pm 4 | 35 | ² AVERY | 80 SPEC | $\gamma N \rightarrow D^{*+}$ |
| 1854 \pm 6 | 94 | ² ATIYA | 79 SPEC | $\gamma N \rightarrow D^0 \overline{D}^0$ |
| 1850 ± 15 | 64 | BALTAY | 78c HBC | $\nu N \rightarrow K^0 \pi \pi$ |
| 1863 \pm 3 | | GOLDHABER | 77 MRK1 | D^0 , D^+ recoil spectra |
| $1863.3\pm~0.9$ | | ¹ PERUZZI | 77 MRK1 | e^+e^- 3.77 GeV |
| 1868 ±11 | | PICCOLO | 77 MRK1 | e^+e^- 4.03, 4.41 GeV |
| 1865 ± 15 | 234 | GOLDHABER | 76 MRK1 | $K\pi$ and $K3\pi$ |

¹ PERUZZI 77 and SCHINDLER 81 errors do not include the 0.13% uncertainty in the absolute SPEAR energy calibration. TRILLING 81 uses the high precision $J/\psi(1S)$ and $\psi(2S)$ measurements of ZHOLENTZ 80 to determine this uncertainty and combines the PERUZZI 77 and SCHINDLER 81 results to obtain the value quoted. TRILLING 81 enters the fit in the D^{\pm} mass, and PERUZZI 77 and SCHINDLER 81 enter in the $m_{D^{\pm}} - m_{D^0}$, below.

 2 Error does not include possible systematic mass scale shift, estimated to be less than 5 MeV.

$m_{D^{\pm}} - m_{D^{0}}$

The fit includes D^{\pm} , D^0 , D_s^{\pm} , $D^{*\pm}$, D^{*0} , and $D_s^{*\pm}$ mass and mass difference measurements.

| VALUE (MeV) | DOCUMENT ID | | TECN | COMMENT |
|---------------------------------|--------------------------------|-------------|----------------------|--|
| 4.76±0.10 OUR FIT | Error includes scale factor of | 1.1. | | |
| 4.74±0.28 OUR AVER | RAGE | | | |
| 4.7 ±0.3 | ³ SCHINDLER | 81 | MRK2 | e ⁺ e ⁻ 3.77 GeV |
| $5.0 \ \pm 0.8$ | ³ PERUZZI | 77 | MRK1 | e^+e^- 3.77 GeV |
| ³ See the footnote o | n TRILLING 81 in the D^0 and | d D^{\pm} | ⁼ section | s on the mass. |

D⁰ MEAN LIFE

Measurements with an error $>0.05\times 10^{-12}\,\text{s}$ are omitted from the average, and those with an error $>0.1\times 10^{-12}\,\text{s}$ or that have been superseded by later results have been removed from the Listings.

| 0.415 \pm 0.004 OUR AVERAGE 0.413 \pm 0.004 \pm 0.003 16k FRABETTI 94D E687 $K^-\pi^+, K^-\pi^+\pi^+\pi^-$ 0.424 \pm 0.011 \pm 0.007 5118 FRABETTI 91 E687 $K^-\pi^+, K^-\pi^+\pi^+\pi^-$ 0.417 \pm 0.018 \pm 0.015 890 ALVAREZ 90 NA14 $K^-\pi^+, K^-\pi^+\pi^+\pi^-$ 0.388 $^+$ 0.023 641 ⁴ BARLAG 90C ACCM π^- Cu 230 GeV 0.48 \pm 0.04 \pm 0.03 776 ALBRECHT 88I ARG e^+e^- 10 GeV 0.422 \pm 0.008 \pm 0.010 4212 RAAB 88 E691 Photoproduction 0.42 \pm 0.05 90 BARLAG 87B ACCM K^- and π^- 200 GeV • • We do not use the following data for averages, fits, limits, etc. • • • 0.34 $^+$ 0.06 \pm 0.03 58 AMENDOLIA 88 SPEC Photoproduction 0.46 $^+$ 0.06 \pm 145 AGUILAR- 87D HYBR π^- p and pp | <u>1ENT ID TECN COMMENT</u> |
|--|---|
| 0.413 \pm 0.004 \pm 0.003 16k FRABETTI 94D E687 $K^-\pi^+, K^-\pi^+\pi^+\pi^-$ 0.424 \pm 0.011 \pm 0.007 5118 FRABETTI 91 E687 $K^-\pi^+, K^-\pi^+\pi^+\pi^-$ 0.417 \pm 0.018 \pm 0.015 890 ALVAREZ 90 NA14 $K^-\pi^+, K^-\pi^+\pi^+\pi^-$ 0.388 $^+$ 0.023 641 ⁴ BARLAG 90C ACCM π^- Cu 230 GeV 0.48 \pm 0.04 \pm 0.03 776 ALBRECHT 881 ARG e^+e^- 10 GeV 0.422 \pm 0.08 \pm 0.010 4212 RAAB 88 E691 Photoproduction 0.42 \pm 0.05 90 BARLAG 87B ACCM K^- and π^- 200 GeV • • We do not use the following data for averages, fits, limits, etc. • • 0.34 $^+$ 0.06 \pm 0.03 58 AMENDOLIA 88 SPEC Photoproduction 0.46 $^+$ 0.06 \pm 145 AGUILAR- 87D HYBR π^- p and pp | |
| $0.424 \pm 0.011 \pm 0.007$ 5118 FRABETTI 91 E687 $K^-\pi^+, K^-\pi^+\pi^+\pi^ 0.417 \pm 0.018 \pm 0.015$ 890 ALVAREZ 90 NA14 $K^-\pi^+, K^-\pi^+\pi^+\pi^ 0.388^{+0.023}_{-0.021}$ 641 4 BARLAG 90c ACCM π^- Cu 230 GeV $0.48 \pm 0.04 \pm 0.03$ 776 ALBRECHT 881 ARG e^+e^- 10 GeV $0.422 \pm 0.008 \pm 0.010$ 4212 RAAB 88 E691 Photoproduction 0.42 ± 0.05 90 BARLAG 87B ACCM K^- and π^- 200 GeV • • We do not use the following data for averages, fits, limits, etc. • • $0.34 \ -0.05 \ \pm 0.03$ 58 AMENDOLIA 88 SPEC Photoproduction $0.46 \ +0.06 \ -0.05$ 145 AGUILAR- 87D HYBR $\pi^- p$ and pp | ETTI 94D E687 $K^- \pi^+$, $K^- \pi^+ \pi^+ \pi^-$ |
| 0.417±0.018±0.015 890 ALVAREZ 90 NA14 $K^-\pi^+, K^-\pi^+\pi^+\pi^-$ 0.388 $^+0.023_{-0.021}$ 641 ⁴ BARLAG 90C ACCM π^- Cu 230 GeV 0.48 ±0.04 ±0.03 776 ALBRECHT 881 ARG e^+e^- 10 GeV 0.422±0.008±0.010 4212 RAAB 88 E691 Photoproduction 0.42 ±0.05 90 BARLAG 87B ACCM K^- and π^- 200 GeV • • We do not use the following data for averages, fits, limits, etc. • • • 0.34 $^+0.06_{-0.05}$ ±0.03 58 AMENDOLIA 88 SPEC Photoproduction 0.46 $^+0.06_{-0.05}$ 145 AGUILAR 87D HYBR $\pi^- p$ and pp | ETTI 91 E687 $K^- \pi^+$, $K^- \pi^+ \pi^+ \pi^-$ |
| $0.388^{+0.023}_{-0.021}$ 641 ⁴ BARLAG 90C ACCM π^- Cu 230 GeV $0.48 \pm 0.04 \pm 0.03$ 776 ALBRECHT 881 ARG e^+e^- 10 GeV $0.422\pm 0.008\pm 0.010$ 4212 RAAB 88 E691 Photoproduction 0.42 ± 0.05 90 BARLAG 87B ACCM K^- and π^- 200 GeV $\bullet \bullet$ We do not use the following data for averages, fits, limits, etc. $\bullet \bullet$ \bullet $0.34 \ -0.05 \ \pm 0.03$ 58 AMENDOLIA 88 SPEC Photoproduction $0.46 \ +0.06 \ -0.05$ 145 AGUILAR- 87D HYBR $\pi^- p$ and pp | REZ 90 NA14 $K^{-}\pi^{+}$, $K^{-}\pi^{+}\pi^{+}\pi^{-}$ |
| $0.48 \pm 0.04 \pm 0.03$ 776ALBRECHT881ARG e^+e^- 10 GeV $0.422\pm 0.008\pm 0.010$ 4212RAAB88E691Photoproduction 0.42 ± 0.05 90BARLAG87BACCM K^- and π^- 200 GeV• • We do not use the following data for averages, fits, limits, etc. • •• $0.34 \ -0.05 \ \pm 0.03$ 58AMENDOLIA88SPECPhotoproduction $0.46 \ +0.06 \ -0.05$ 145AGUILAR-87DHYBR $\pi^- p$ and pp | AG 90C ACCM π^- Cu 230 GeV |
| $0.422 \pm 0.008 \pm 0.010$ 4212RAAB88E691Photoproduction 0.42 ± 0.05 90BARLAG87BACCM K^- and π^- 200 GeV• • We do not use the following data for averages, fits, limits, etc. • •• $0.34 \ -0.05 \ \pm 0.03$ 58AMENDOLIA88SPECPhotoproduction $0.46 \ +0.06 \ -0.05$ 145AGUILAR-87DHYBR $\pi^- p$ and pp | ECHT 881 ARG e^+e^- 10 GeV |
| 0.42 ± 0.05 90 BARLAG 87B ACCM K^- and π^- 200 GeV • • We do not use the following data for averages, fits, limits, etc. • • • 0.34 $\substack{+0.06 \\ -0.05} \pm 0.03$ 58 AMENDOLIA 88 SPEC Photoproduction 0.46 $\substack{+0.06 \\ -0.05}$ 145 AGUILAR 87D HYBR $\pi^- p$ and pp | 88 E691 Photoproduction |
| • • We do not use the following data for averages, fits, limits, etc. • • • $0.34 \begin{array}{c} +0.06 \\ -0.05 \end{array} \pm 0.03 58 \qquad \text{AMENDOLIA} 88 \text{SPEC} \text{Photoproduction}$ $0.46 \begin{array}{c} +0.06 \\ -0.05 \end{array} 145 \qquad \text{AGUILAR}, \qquad 870 \text{HYBR} \pi^- p \text{ and } pp$ | AG 87B ACCM K^- and π^- 200 GeV |
| $0.34 \begin{array}{c} +0.06 \\ -0.05 \end{array} \pm 0.03$ 58 AMENDOLIA 88 SPEC Photoproduction $0.46 \begin{array}{c} +0.06 \\ -0.05 \end{array}$ 145 AGUILAR 87D HYBR $\pi^{-} p$ and pp | for averages, fits, limits, etc. $ullet$ $ullet$ $ullet$ |
| 0.46 $+$ 0.06 145 AGUILAR 87D HYBR $\pi^- p$ and pp | DOLIA 88 SPEC Photoproduction |
| | AR 87D HYBR $\pi^- p$ and pp |
| 0.50 \pm 0.07 \pm 0.04 317 CSORNA 87 CLEO e^+e^- 10 GeV | NA 87 CLEO e^+e^- 10 GeV |
| 0.61 \pm 0.09 \pm 0.03 50 ABE 86 HYBR γp 20 GeV | 86 HYBR γp 20 GeV |
| 0.47 $^{+0.09}_{-0.08}$ ± 0.05 74 GLADNEY 86 MRK2 e^+e^- 29 GeV | NEY 86 MRK2 e^+e^- 29 GeV |
| $0.43 \begin{array}{c} +0.07 \\ -0.05 \end{array} \begin{array}{c} +0.01 \\ -0.02 \end{array}$ 58 USHIDA 86B EMUL $ u$ wideband | DA 86B EMUL ν wideband |
| 0.37 $^{+0.10}_{-0.07}$ 26 BAILEY 85 SILI π^- Be 200 GeV | Y 85 SILI π^- Be 200 GeV |

⁴ BARLAG 90C estimate systematic error to be negligible.

$$\left|m_{D_{1}^{0}}-m_{D_{2}^{0}}\right|$$

The D_1^0 and D_2^0 are the mass eigenstates of the D^0 meson. To calculate the following limits, we use $\Delta m = [2r/(1-r)]^{1/2}\hbar/4.15 \times 10^{-13}$ s, where r is the experimental $D^0-\overline{D}^0$ mixing ratio.

| VALUE (10 10 \hbar s $^{-1}$) | CL% | DOCUMENT ID | | TECN | COMMENT |
|---|-------------|-----------------------------------|----------------|---------------------------|---|
| <24 | 90 | ⁵ AITALA | 96 C | E791 | π^- nucleus, 500 GeV |
| • • We do not use the | e following | g data for averages | , fits | , limits, | etc. • • • |
| <32 | 90 | ^{5,7} AITALA | 98 | E791 | π^- nucleus, 500 GeV |
| <21 | 90 | ^{7,8} ANJOS | 88 C | E691 | Photoproduction |
| ⁵ This limit is inferred | from the | $D^0 - \overline{D}^0$ mixing rat | іо Г(<i>І</i> | $K^+\ell^-\overline{\nu}$ | $\overline{ u}_\ell$ (via $\overline{D}{}^0$))/Γ($K^- \ell^+ u_\ell$) |
| given near the end of the D^0 Listings. ⁶ AITALA 98 allows interference between the doubly Cabibbo-suppressed and mixing amplitudes, and also allows CP violation in this term. ⁷ This limit is inferred from the $D^0-\overline{D}^0$ mixing ratio $\Gamma(K^+\pi^- \text{ or } K^+\pi^-\pi^+\pi^- (\text{via } \overline{D}^0))/\Gamma(K^-\pi^+ \text{ or } K^-\pi^+\pi^+\pi^-)$ near the end of the D^0 Listings. Decay-time information is used to distinguish doubly Cabibbo-suppressed decays from $D^0-\overline{D}^0$ mixing. ⁸ ANJOS 88C assumes no interference between doubly Cabibbo-suppressed and mixing amplitudes. When interference is allowed, the limit degrades by about a factor of two. | | | | | suppressed and mixing am- π^- or $K^+\pi^-\pi^+\pi^-$ (via Listings. Decay-time in- ecays from $D^0-\overline{D}^0$ mixing. bo-suppressed and mixing by about a factor of two. |

$|\Gamma_{D_1^0} - \Gamma_{D_2^0}|/\Gamma_{D^0}$ MEAN LIFE DIFFERENCE/AVERAGE

The D_1^0 and D_2^0 are the mass eigenstates of the D^0 meson. To calculate the following limits, we use $\Delta\Gamma/\Gamma = [8r/(1+r)]^{1/2}$, where r is the experimental $D^0-\overline{D}^0$ mixing ratio.

| VALUE | <u>CL%</u> | DOCUMENT ID | TECN | COMMENT | |
|---|------------|--|---------------------|---|--|
| <0.20 | 90 | ⁹ AITALA | 96C E791 | π^- nucleus, 500 GeV | |
| • • • We do not use the | follov | ving data for averages | , fits, limits, | etc. • • • | |
| <0.26 <0.17 | 90 90 | $^{10,11}_{11,12}$ AITALA 11,12 ANJOS | 98 E791 88c E691 | π^- nucleus, 500 GeV Photoproduction | |
| ⁹ This limit is inferred from the $D^0 - \overline{D}^0$ mixing ratio $\Gamma(K^+ \ell^- \overline{\nu}_\ell (\text{via } \overline{D}^0)) / \Gamma(K^- \ell^+ \nu_\ell)$ given near the end of the D^0 Listings. | | | | | |
| ¹⁰ AITALA 98 allows interference between the doubly Cabibbo-suppressed and mixing amplitudes, and also allows <i>CP</i> violation in this term. ¹¹ This limit is inferred from the $D^0-\overline{D}^0$ mixing ratio $\Gamma(K^+\pi^- \text{ or } K^+\pi^-\pi^+\pi^- (via))$ | | | | | |
| $\overline{D}^{0}))/\Gamma(K^{-}\pi^{+} \text{ or } K)$ | $(-\pi^+)$ | $\pi^+\pi^-$) near the end | d of the D^0 | Listings. Decay-time in- | |

formation is used to distinguish doubly Cabibbo-suppressed decays from $D^0 - \overline{D}^0$ mixing. ¹² ANJOS 88C assumes no interference between doubly Cabibbo-suppressed and mixing amplitudes. When interference is allowed, the limit degrades by about a factor of two.

D⁰ DECAY MODES

 \overline{D}^0 modes are charge conjugates of the modes below.

| | Mode | Fraction (Γ_i/Γ) | Scale factor/ Confidence level |
|----------------|--|-----------------------------------|-----------------------------------|
| | Inclusive | e modes | |
| Γ_1 | e^+ anything | (6.75±0.29) % | |
| Γ2 | μ^+ anything | (6.6 \pm 0.8)% | |
| Г3 | K^- anything | (53 ±4)% | S=1.3 |
| Г ₄ | $\overline{K}{}^0$ anything $+ \ K{}^0$ anything | $(42 \pm 5)\%$ | |
| Γ ₅ | K^+ anything | (3.4 $\substack{+0.6\\-0.4}$) % | |
| Г ₆ | η anything | [a] < 13 % | CL=90% |
| | Semilepto | nic modes | |
| Γ ₇ | ${\cal K}^-\ell^+ u_\ell$ | [b] (3.50±0.17) % | S=1.3 |
| Г ₈ | $K^- e^+ \nu_e$ | (3.66±0.18) % | |
| Г9 | ${\cal K}^- \mu^+ u_\mu$ | (3.23±0.17) % | |
| Γ_{10} | $K^-\pi^0 e^+ \nu_e$ | (1.6 $\substack{+1.3\\-0.5}$)% | |
| Γ_{11} | $\overline{K}^0 \pi^- e^+ \nu_e$ | (2.8 $\substack{+1.7\\-0.9}$)% | |

HTTP://PDG.LBL.GOV

A fraction of the following resonance mode has already appeared above as a submode of a charged-particle mode.

| Γ ₁₈ | $K^{*}(892)^{-}e^{+}\nu_{e}$ | | (2.02±0.33) % | | | | | |
|-----------------|--|-----|--------------------------------------|-------|--|--|--|--|
| | Hadronic modes with a \overline{K} or $\overline{K}\overline{K}\overline{K}$ | | | | | | | |
| Γ ₁₉ | $K^-\pi^+$ | | (3.85±0.09) % | | | | | |
| Γ ₂₀ | $\overline{K}^0 \pi^0$ | | (2.12±0.21) % | S=1.1 | | | | |
| Γ ₂₁ | $\overline{K}^0 \pi^+ \pi^-$ | [c] | (5.4 \pm 0.4)% | S=1.2 | | | | |
| Γ ₂₂ | $\overline{K}^0 \rho^0$ | | (1.21±0.17) % | | | | | |
| Γ ₂₃ | $\overline{K}^0 f_0(980)$ | | (3.0 \pm 0.8) $	imes$ 10 $^{-3}$ | | | | | |
| | \times B($f_0 \rightarrow \pi^+ \pi^-$) | | _ | | | | | |
| Г ₂₄ | $K^0 f_2(1270)$ | | (2.4 \pm 0.9) $	imes$ 10 $^{-3}$ | | | | | |
| | \times B($f_2 \rightarrow \pi^+ \pi^-$) | | | | | | | |
| Γ ₂₅ | $K^0 f_0(1370)$ | | (4.3 ± 1.3) $	imes 10^{-3}$ | | | | | |
| | \times B($f_0 \rightarrow \pi^+ \pi^-$) | | | | | | | |
| Г ₂₆ | $K^{*}(892)^{-}\pi^{+}$ | | (3.4 ± 0.3)% | | | | | |
| | $\times B(K^{*-} \rightarrow K^0 \pi^-)$ | | 2 | | | | | |
| Γ ₂₇ | $K_0^*(1430)^- \pi^+$ | | $(6.4 \pm 1.6) \times 10^{-3}$ | | | | | |
| | $\times \ B(\mathcal{K}^*_0(1430)^- \rightarrow \ \overline{\mathcal{K}}^0 \pi^-)$ | | | | | | | |
| Г ₂₈ | $\overline{K}{}^{0}\pi^{+}\pi^{-}$ nonresonant | | (1.47±0.24) % | | | | | |
| Γ ₂₉ | $K^-\pi^+\pi^0$ | [c] | (13.9 ± 0.9)% | S=1.3 | | | | |
| Г ₃₀ | $\mathcal{K}^- \rho^+$ | | (10.8 ± 1.0) % | | | | | |
| Г ₃₁ | $K^{*}(892)^{-}\pi^{+}$ | | (1.7 ± 0.2)% | | | | | |
| | $\underline{} \times B(K^{*-} \rightarrow K^{-} \pi^{0})$ | | | | | | | |
| Г ₃₂ | $K^*(892)^0 \pi^0$ | | (2.1 ± 0.3)% | | | | | |
| | $\times B(K^{*0} \to K^{-}\pi^{+})$ | | 2 | | | | | |
| Г ₃₃ | $K^-\pi^+\pi^0$ nonresonant | | $(6.9 \pm 2.5) \times 10^{-3}$ | | | | | |
| Γ ₃₄ | $K^0 \pi^0 \pi^0$ | | — | | | | | |
| Г ₃₅ | $K^{*}(892)^{0}\pi^{0}$ | | (1.1 ± 0.2) % | | | | | |
| _ | $\times B(K^{*0} \to K^0 \pi^0)$ | | 2 | | | | | |
| I 36 | $K^{0}\pi^{0}\pi^{0}$ nonresonant | | $(7.9 \pm 2.1) \times 10^{-3}$ | | | | | |
| l ₃₇ | $K^-\pi^+\pi^+\pi^-$ | [c] | (7.6 ±0.4)% | S=1.1 | | | | |
| I 38 | $K^-\pi^+\rho^0$ total | | $(6.3 \pm 0.4)\%$ | | | | | |
| I 39 F | $\frac{\kappa}{\kappa} \pi \cdot \rho^{\circ} 3$ -body | | $(4.8 \pm 2.1) \times 10^{-3}$ | | | | | |
| I 40 | $\kappa^{-}(\delta 92)^{\circ}\rho^{\circ}$ | | $(9.8 \pm 2.2) \times 10^{-5}$ | | | | | |
| | \times B($\kappa^{+} \rightarrow \kappa^{-} \pi^{+}$) | | | | | | | |

HTTP://PDG.LBL.GOV

$$\begin{array}{lll} \begin{array}{ccccc} \mathbb{F}_{41} & \mathbb{K}^{-}a_{1}(1260)^{+} & \mathbb{I}_{4}^{+}\pi^{+}\pi^{+}\pi^{-}) \\ \mathbb{F}_{42} & \overline{\mathbb{K}}^{*}(892)^{0}\pi^{+}\pi^{-}\operatorname{total} & (1.5 \pm 0.4) \% \\ & \times \mathbb{B}(\overline{\mathbb{K}}^{*0} \to \overline{\mathbb{K}}^{-}\pi^{+}) \\ \mathbb{F}_{43} & \overline{\mathbb{K}}^{*}(892)^{0}\pi^{+}\pi^{-}3 \text{-body} & (9.5 \pm 2.1) \times 10^{-3} \\ & \times \mathbb{B}(\mathbb{K}_{1}(1270)^{-}\pi^{+} & [d] & (3.6 \pm 1.0) \times 10^{-3} \\ & \times \mathbb{B}(\mathbb{K}_{1}(1270)^{-} \to \overline{\mathbb{K}}^{-}\pi^{+}\pi^{-}\pi^{-}) \\ \mathbb{F}_{45} & \mathbb{K}^{-}\pi^{+}\pi^{+}\pi^{-}\pi^{0} & [c] & (10.0 \pm 1.2) \% \\ \mathbb{F}_{47} & \overline{\mathbb{K}}^{0}\eta^{+}\pi^{-}\pi^{0} & \mathbb{K}^{0}\pi^{-} \\ \mathbb{F}_{49} & \mathbb{K}^{*}(892)^{-}\rho^{+} & (4.1 \pm 1.6) \% \\ \mathbb{F}_{49} & \mathbb{K}^{*}(892)^{-}\rho^{+} & (4.1 \pm 1.6) \% \\ & \times \mathbb{B}(\mathbb{K}^{*-} \to \overline{\mathbb{K}}^{0}\pi^{-}) \\ \mathbb{F}_{50} & \overline{\mathbb{K}}^{*}(892)^{0}\rho^{0} & (4.9 \pm 1.1) \times 10^{-3} \\ & \times \mathbb{B}(\mathbb{K}^{*1} \oplus \overline{\mathbb{K}}^{0}\pi^{0}) \\ \mathbb{F}_{51} & \mathbb{K}_{1}(1270)^{-}\pi^{+} & [d] & (5.1 \pm 1.4) \times 10^{-3} \\ & \times \mathbb{B}(\mathbb{K}^{*0} \to \overline{\mathbb{K}}^{0}\pi^{-}) \\ \mathbb{F}_{52} & \overline{\mathbb{K}}^{*}(892)^{0}\pi^{+}\pi^{-}3 \text{-body} & (4.8 \pm 1.1) \times 10^{-3} \\ & \times \mathbb{B}(\overline{\mathbb{K}^{*0}} \to \overline{\mathbb{K}}^{0}\pi^{-}) \\ \mathbb{F}_{54} & \mathbb{K}^{-}\pi^{+}\pi^{-}\pi^{0} & (1.2 \pm 0.6) \% \\ \mathbb{F}_{55} & \mathbb{K}^{-}\pi^{+}\pi^{+}\pi^{-}\pi^{0} & (1.2 \pm 0.6) \% \\ & \times \mathbb{B}(\overline{\mathbb{K}^{*0}} \to \mathbb{K}^{-}\pi^{+}) \\ \mathbb{F}_{57} & \overline{\mathbb{K}}^{*}(892)^{0}\mu & (2.9 \pm 0.8) \times 10^{-3} \\ & \times \mathbb{B}(\overline{\mathbb{K}^{*0}} \to \mathbb{K}^{-}\pi^{+}) \\ \mathbb{F}_{58} & \mathbb{K}^{-}\pi^{+}\pi^{-}\pi^{0} & (10.6 \pm \frac{7.3}{-3}) \% \\ \mathbb{F}_{59} & \overline{\mathbb{K}}^{*}(892)^{0}\omega & (7 \pm 3) \times 10^{-3} \\ \mathbb{F}_{61} & \overline{\mathbb{K}}^{0}\pi^{+}\pi^{-}\pi^{0}\pi^{0}(\pi^{0}) & (10.6 \pm \frac{7.3}{-3}) \% \\ \mathbb{F}_{61} & \overline{\mathbb{K}}^{0}\pi^{+}\pi^{-}\pi^{0}\pi^{0}(\pi^{0}) & (10.6 \pm \frac{7.3}{-3}) \% \\ \mathbb{F}_{61} & \overline{\mathbb{K}}^{0}\pi^{+}\pi^{-}\pi^{-}\pi^{-} & (5.8 \pm 1.6) \times 10^{-3} \\ \mathbb{I}_{64} & \mathbb{K}^{0}\overline{\mathbb{K}}^{0}\overline{\mathbb{K}}^{0}\overline{\mathbb{K}}^{0}\overline{\mathbb{K}}^{0}\overline{\mathbb{K}}^{0}\overline{\mathbb{K}}^{0}\overline{\mathbb{K}}^{0}\overline{\mathbb{K}}^{0}\overline{\mathbb{K}}^{0}\overline{\mathbb{K}}^{0}\overline{\mathbb{K}}^{0}\overline{\mathbb{K}}^{0}\overline{\mathbb{K}}^{0}\overline{\mathbb{K}}^{0}\overline{\mathbb{K}}^{0}\overline{\mathbb{K}}^{-}\pi^{-1} \\ \mathbb{I}_{65} & \mathbb{K}_{5}^{0}\mathbb{K}_{5}^{0}\mathbb{K}^{0}\overline{\mathbb{K}}^{0}\overline{\mathbb{K}}^{0}\overline{\mathbb{K}}^{0}\overline{\mathbb{K}}^{0}\overline{\mathbb{K}}^{0}\overline{\mathbb{K}}^{-}\pi^{-1} \\ \mathbb{I}_{66} & \overline{\mathbb{K}}^{0}\overline{\mathbb{K}}^{0}\overline{\mathbb{K}}^{0}\overline{\mathbb{K}}^{0}\overline{\mathbb{K}}^{0}\overline{\mathbb{K}}^{0}\overline{\mathbb{K}}^{0}\overline{\mathbb{K}}^{-}\pi$$

Fractions of many of the following modes with resonances have already appeared above as submodes of particular charged-particle modes. (Modes for which there are only upper limits and $\overline{K}^*(892)\rho$ submodes only appear below.)

| Г ₆₈ | $\overline{K}^0 \eta$ | (7.1 ± 1.0) |) × 10 ⁻³ | |
|------------------|--|-----------------|-----------------------|--------|
| Γ ₆₉ | $\overline{K}^0 \rho^0$ | (1.21 ± 0.1) | 7)% | |
| Γ ₇₀ | $K^{-}\rho^{+}$ | (10.8 ±1.0 |)% | S=1.2 |
| Γ_{71} | $\overline{K}^{0}\omega$ | (2.1 ±0.4 |)% | |
| Γ_{72} | $\overline{K}^0 \eta'(958)$ | (1.72 ± 0.2) | 6) % | |
| Γ_{73} | $\overline{K}^0 f_0(980)$ | 、 (5.7 ±1.6 | $) \times 10^{-3}$ | |
| Γ ₇₄ | $\overline{K}^0\phi$ | (8.6 ±1.0 | $) \times 10^{-3}$ | |
| Γ ₇₅ | $K^{-}a_{1}(1260)^{+}$ | , (7.3 ±1.1 |)% | |
| Γ ₇₆ | $\overline{K}^{0} a_{1}(1260)^{0}$ | < 1.9 | % | CL=90% |
| Γ ₇₇ | $\overline{K}^{0} f_{2}(1270)$ | (4.2 ± 1.5 |) × 10 ⁻³ | |
| Γ ₇₈ | $K^{-}\bar{a_{2}}(1320)^{+}$ | < 2 | $\times 10^{-3}$ | CL=90% |
| Γ ₇₉ | $\overline{K}^0 f_0(1370)$ | (7.0 ± 2.1) |) × 10 ⁻³ | |
| Γ ₈₀ | $K^{*}(892)^{-}\pi^{+}$ | (5.1 ± 0.4) |)% | S=1.2 |
| Γ ₈₁ | $\overline{K}^{*}(892)^{0}\pi^{0}$ | (3.2 ±0.4 |)% | |
| Γ ₈₂ | $\overline{K}^*(892)^0 \pi^+ \pi^-$ total | (2.3 ± 0.5) |)% | |
| Γ ₈₃ | $\overline{K}^{*}(892)^{0}\pi^{+}\pi^{-}$ 3-body | (1.43±0.3 | 2) % | |
| Γ ₈₄ | $K^- \pi^+ \rho^0$ total | (6.3 ± 0.4) |)% | |
| Γ ₈₅ | $\mathcal{K}^- \pi^+ ho^0$ 3-body | (4.8 ± 2.1) | $) \times 10^{-3}$ | |
| Г ₈₆ | $\overline{K}^{*}(892)^{0}\rho^{0}$ | (1.47 ± 0.3) | 3) % | |
| Г ₈₇ | $\overline{K}^*(892)^0 ho^0$ transverse | ($1.5~\pm0.5$ |) % | |
| Г ₈₈ | $\overline{K}^*(892)^0 \rho^0 S$ -wave | (2.8 ± 0.6 |)% | |
| Г ₈₉ | $\overline{K}^*(892)^0 \rho^0 S$ -wave long. | < 3 | imes 10 ⁻³ | CL=90% |
| Г ₉₀ | $\overline{K}^*(892)^0 ho^0$ <i>P</i> -wave | < 3 | imes 10 ⁻³ | CL=90% |
| Г ₉₁ | $\overline{K}^*(892)^0 ho^0D$ -wave | ($1.9~\pm0.6$ |) % | |
| Г ₉₂ | $K^{*}(892)^{-} \rho^{+}$ | (6.1 ± 2.4) |)% | |
| Г ₉₃ | ${\cal K}^*(892)^- ho^+$ longitudinal | ($2.9~\pm1.2$ |) % | |
| Г ₉₄ | ${\cal K}^*(892)^- ho^+$ transverse | (3.2 ± 1.8 |) % | |
| Г ₉₅ | ${\it K}^{st}$ (892) $^{-} ho^{+}{\it P}$ -wave | < 1.5 | % | CL=90% |
| Г ₉₆ | $K^{-}\pi^{+}f_{0}(980)$ | < 1.1 | % | CL=90% |
| Г ₉₇ | $\overline{K}^{*}(892)^{0} f_{0}(980)$ | < 7 | imes 10 ⁻³ | CL=90% |
| Г ₉₈ | $K_1(1270)^- \pi^+$ | [d] (1.06±0.2 | 9) % | |
| Г ₉₉ | $K_1(1400)^- \pi^+$ | < 1.2 | % | CL=90% |
| Γ_{100} | $\overline{K}_{1}(1400)^{0}\pi^{0}$ | < 3.7 | % | CL=90% |
| Γ ₁₀₁ | $K^{*}(1410)^{-}\pi^{+}$ | < 1.2 | % | CL=90% |
| Γ ₁₀₂ | $K_0^*(1430)^- \pi^+$ | (1.04 ± 0.2) | 6) % | |
| Γ ₁₀₃ | $K_2^*(1430)^- \pi^+$ | < 8 | imes 10 ⁻³ | CL=90% |
| Γ ₁₀₄ | $\overline{K}_{2}^{\bar{*}}(1430)^{0}\pi^{0}$ | < 4 | imes 10 ⁻³ | CL=90% |
| Γ ₁₀₅ | $\overline{K}^{*}(892)^{0}\pi^{+}\pi^{-}\pi^{0}$ | (1.8 ± 0.9 |) % | |

| Γ ₁₀₆ | $\overline{K}^{*}(892)^{0}\eta$ | (1.9 ± 0.5)% | |
|------------------|--|--------------------------------------|--------|
| Γ ₁₀₇ | $K - \pi^+ \omega$ | (3.0 ± 0.6)% | |
| Γ ₁₀₈ | $K^{*}(892)^{0}\omega$ | (1.1 ± 0.5)% | |
| Γ ₁₀₉ | $K^{-}\pi^{+}\eta'(958)$ | $(7.0 \pm 1.8) \times 10^{-3}$ | |
| Γ ₁₁₀ | $K^{*}(892)^{0}\eta'(958)$ | < 1.1 $\times 10^{-3}$ | CL=90% |
| | Pionic | modes | |
| Γ_{111} | $\pi^+\pi^-$ | $(1.53\pm0.09)	imes10^{-3}$ | |
| Г ₁₁₂ | $\pi^0\pi^0$ | (8.5 ± 2.2) $	imes 10^{-4}$ | |
| Γ_{113} | $\pi^+\pi^-\pi^0$ | (1.6 \pm 1.1)% | S=2.7 |
| Г ₁₁₄ | $\pi^+\pi^+\pi^-\pi^-$ | (7.4 \pm 0.6) $	imes$ 10 $^{-3}$ | |
| Г ₁₁₅ | $\pi^{+}\pi^{+}\pi^{-}\pi^{-}\pi^{0}$ | $(1.9 \pm 0.4)\%$ | |
| Γ ₁₁₆ | $\pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^-$ | (4.0 ± 3.0) $	imes 10^{-4}$ | |
| | Hadronic modes | s with a $K\overline{K}$ pair | |
| Г ₁₁₇ | K^+K^- | ($4.27 \pm 0.16) 	imes 10^{-3}$ | |
| Γ_{118} | $K^0 \overline{K}^0$ | ($6.5~\pm1.8$) $	imes10^{-4}$ | S=1.2 |
| Г ₁₁₉ | $K^0 K^- \pi^+$ | (6.4 ± 1.0) $	imes 10^{-3}$ | S=1.1 |
| Г ₁₂₀ | $\overline{K}^*(892)^0 K^0$ | $< 1.1 \times 10^{-3}$ | CL=90% |
| | $\times \ B(\overline{K}^{*0} ightarrow \ K^- \pi^+)$ | | |
| Γ_{121} | $K^{*}(892)^{+}K^{-}$ | (2.3 ± 0.5) $	imes 10^{-3}$ | |
| | \times B($K^{*+} \rightarrow K^0 \pi^+$) | | |
| Γ_{122} | $K^0 K^- \pi^+$ nonresonant | $(2.3 \pm 2.3) \times 10^{-3}$ | |
| Г ₁₂₃ | $K^{0}K^{+}\pi^{-}$ | $(5.0 \pm 1.0) \times 10^{-3}$ | |
| Г ₁₂₄ | $K^{*}(892)^{0}K^{0}$ | $< 5 \times 10^{-4}$ | CL=90% |
| | \times B($K^{*0} \rightarrow K^+ \pi^-$) | 2 | |
| Γ ₁₂₅ | $K^{*}(892)^{-}K^{+}$ | $(1.2 \pm 0.7) \times 10^{-3}$ | |
| | $\times B(K^{*-} \rightarrow K^0 \pi^-)$ | | |
| Γ ₁₂₆ | $\overline{\it K}{}^{0}{\it K}{}^{+}\pi^{-}$ nonresonant | $(3.9 + 2.3) \times 10^{-3}$ | |
| F 107 | $\kappa^+ \kappa^- \pi^0$ | $(13 + 04) \times 10^{-3}$ | |
| Γ ₁₂₀ | $K_{0}^{0}K_{0}^{0}\pi^{0}$ | $< 5.9 \times 10^{-4}$ | |
| Γ ₁₂₀ | $K^+K^-\pi^+\pi^-$ | [e] (252+024) × 10 ⁻³ | |
| Γ ₁₂₀ | $\phi \pi^+ \pi^- \times B(\phi \to K^+ K^-)$ | $(53 \pm 14) \times 10^{-4}$ | |
| Γ ₁₀₁ | $\phi a^0 \times B(\phi \to K^+ K^-)$ | $(30 \pm 16) \times 10^{-4}$ | |
| Γ ₁₂₂ | $K^+ K^- a^0 3$ -body | $(91 + 23) \times 10^{-4}$ | |
| Γ_{122} | $K^{*}(892)^{0}K^{-}\pi^{+}+cc$ | $[f] < 5 \times 10^{-4}$ | |
| • 133 | $\times B(K^{*0} \to K^+ \pi^-)$ | | |
| Γ124 | $K^{*}(892)^{0}\overline{K}^{*}(892)^{0}$ | $(6 + 2) \times 10^{-4}$ | |
| - 134 | × B ² ($K^{*0} \rightarrow K^{+}\pi^{-}$) | (• =) / • | |
| L13E | $K^+K^-\pi^+\pi^-$ non- ϕ | _ | |
| Γ ₁₂₆ | $K^+K^-\pi^+\pi^-$ nonresonant | $< 8 \times 10^{-4}$ | CL=90% |
| Γ ₁₂₇ | $K^0 \overline{K}{}^0 \pi^+ \pi^-$ | $(6.9 \pm 2.7) \times 10^{-3}$ | / V |
| $\Gamma_{1,38}$ | $K^+K^-\pi^+\pi^-\pi^0$ | $(3.1 \pm 2.0) \times 10^{-3}$ | |
| 100 | | . , | |

Fractions of most of the following modes with resonances have already appeared above as submodes of particular charged-particle modes.

| Γ ₁₃₉ | $\overline{K}^*(892)^0 K^0$ | < 1.6 | imes 10 ⁻³ | CL=90% |
|------------------|---|-----------------|-------------------------------------|--------|
| Γ ₁₄₀ | $K^{*}(892)^{+}K^{-}$ | (3.5 ± 0.8 | 3) $	imes$ 10 $^{-3}$ | |
| Γ_{141} | $K^{*}(892)^{0}\overline{K}^{0}$ | < 8 | imes 10 ⁻⁴ | CL=90% |
| Γ ₁₄₂ | $K^{*}(892)^{-}K^{+}$ | ($1.8~\pm1.0$ |) $	imes 10^{-3}$ | |
| Γ ₁₄₃ | $\phi \pi^{0}$ | < 1.4 | imes 10 ⁻³ | CL=90% |
| Γ ₁₄₄ | $\phi \eta$ | < 2.8 | imes 10 ⁻³ | CL=90% |
| Γ ₁₄₅ | $\phi \omega$ | < 2.1 | imes 10 ⁻³ | CL=90% |
| Γ ₁₄₆ | $\phi \pi^+ \pi^-$ | (1.08 ± 0.2) | 29) × 10 ^{-3} | |
| Γ ₁₄₇ | $\phi \rho^0$ | (6 ±3 | $) 	imes 10^{-4}$ | |
| Γ ₁₄₈ | $\phi \pi^+ \pi^-$ 3-body | (7 ± 5) | $)	imes 10^{-4}$ | |
| Γ ₁₄₉ | $K^*(892)^0 K^- \pi^+ + \text{ c.c.}$ | [f] < 8 | imes 10 ⁻⁴ | CL=90% |
| Γ ₁₅₀ | $K^{*}(892)^{0}K^{-}\pi^{+}$ | | | |
| Г ₁₅₁ | $\overline{K}^*(892)^0K^+\pi^-$ | | | |
| Г ₁₅₂ | K*(892) ⁰ K *(892) ⁰ | (1.4 ± 0.5 | 5) $	imes$ 10 $^{-3}$ | |

Doubly Cabibbo suppressed (DC) modes,

| $\Delta C =$ | 2 for | bidden vi | a mixing | (C2I | M) modes, |
|--------------|-------|-----------|------------|------|-----------|
| $\Delta C =$ | 1 wea | k neutra | current | (C1) | modes, or |
| | _ | | () | | |

Lepton Family number (*LF*) violating modes

| Γ ₁₅₃ | $K^+ \ell^- \overline{ u}_\ell$ (via D^0) | C2M | < | 1.7 | $	imes 10^{-4}$ | CL=90% |
|------------------|--|-----|---|----------------|-----------------------|--------|
| Γ ₁₅₄ | $K^+\pi^-$ or | C2M | < | 1.0 | imes 10 ⁻³ | CL=90% |
| | ${\cal K}^+\pi^-\pi^+\pi^-$ (via $\overline{D}{}^0)$ | | | | | |
| Γ_{155} | $K^+\pi^-$ | DC | (| $2.8\ \pm 0.9$ |) × 10 ⁻⁴ | |
| Γ ₁₅₆ | ${\cal K}^+\pi^-$ (via $\overline{D}{}^0)$ | | < | 1.9 | imes 10 ⁻⁴ | CL=90% |
| Γ ₁₅₇ | $K^{+}\pi^{-}\pi^{+}\pi^{-}$ | DC | (| $1.9\ \pm 2.7$ | $) \times 10^{-4}$ | |
| Γ ₁₅₈ | $K^+\pi^-\pi^+\pi^-$ (via $\overline{D}{}^0$) | | < | 4 | imes 10 ⁻⁴ | CL=90% |
| Γ ₁₅₉ | μ^- anything (via $\overline{D}{}^0)$ | | < | 4 | imes 10 ⁻⁴ | CL=90% |
| Γ_{160} | e^+e^- | C1 | < | 1.3 | imes 10 ⁻⁵ | CL=90% |
| Γ ₁₆₁ | $\mu^+\mu^-$ | C1 | < | 4.1 | imes 10 ⁻⁶ | CL=90% |
| Γ ₁₆₂ | $\pi^0 e^+ e^-$ | C1 | < | 4.5 | imes 10 ⁻⁵ | CL=90% |
| Γ ₁₆₃ | $\pi^0 \mu^+ \mu^-$ | C1 | < | 1.8 | imes 10 ⁻⁴ | CL=90% |
| Γ ₁₆₄ | $\eta e^+ e^-$ | C1 | < | 1.1 | imes 10 ⁻⁴ | CL=90% |
| Γ ₁₆₅ | $\eta \mu^+ \mu^-$ | C1 | < | 5.3 | imes 10 ⁻⁴ | CL=90% |
| Γ ₁₆₆ | $ ho^{0}e^{+}e^{-}$ | C1 | < | 1.0 | imes 10 ⁻⁴ | CL=90% |
| Γ ₁₆₇ | $ ho^0 \mu^+ \mu^-$ | C1 | < | 2.3 | imes 10 ⁻⁴ | CL=90% |
| Γ ₁₆₈ | $\omega e^+ e^-$ | C1 | < | 1.8 | imes 10 ⁻⁴ | CL=90% |
| Γ ₁₆₉ | $\omega \mu^+ \mu^-$ | С1 | < | 8.3 | imes 10 ⁻⁴ | CL=90% |
| Γ ₁₇₀ | $\phi e^+ e^-$ | С1 | < | 5.2 | imes 10 ⁻⁵ | CL=90% |
| Γ_{171} | $\phi \mu^+ \mu^-$ | C1 | < | 4.1 | imes 10 ⁻⁴ | CL=90% |

| Γ ₁₇₂ Γ ₁₇₃ Γ ₁₇₄ Γ ₁₇₅ | $\frac{\overline{K}^{0} e^{+} e^{-}}{\overline{K}^{0} \mu^{+} \mu^{-}}$ $\frac{\overline{K}^{*} (892)^{0} e^{+} e^{-}}{\overline{K}^{*} (892)^{0} \mu^{+} \mu^{-}}$ | | [g] < [g] < [g] < [g] < | 1.1 2.6 1.4 1.18 | $	imes 10^{-4} \ 	imes 10^{-4} \ 	imes 10^{-4} \ 	imes 10^{-4} \ 	imes 10^{-3}$ | CL=90% CL=90% CL=90% CL=90% |
|--|---|----|----------------------------------|---------------------------|---|--------------------------------------|
| Γ ₁₇₆ | $\pi^{+}\pi^{-}\pi^{0}\mu^{+}\mu^{-}$ | C1 | < | 8.1 | $\times 10^{-4}$ | CL=90% |
| Γ ₁₇₇ | $\mu^{\pm} e^{\mp}$ | LF | [<i>h</i>] < | 1.9 | imes 10 ⁻⁵ | CL=90% |
| Γ ₁₇₈ | $\pi^0 e^{\pm} \mu^{\mp}$ | LF | [<i>h</i>] < | 8.6 | imes 10 ⁻⁵ | CL=90% |
| Γ ₁₇₉ | $\eta e^{\pm} \mu^{\mp}$ | LF | [<i>h</i>] < | 1.0 | imes 10 ⁻⁴ | CL=90% |
| Γ ₁₈₀ | $ ho^{0}\mathrm{e}^{\pm}\mu^{\mp}$ | LF | [<i>h</i>] < | 4.9 | imes 10 ⁻⁵ | CL=90% |
| Γ ₁₈₁ | $\omega e^{\pm} \mu^{\mp}$ | LF | [<i>h</i>] < | 1.2 | imes 10 ⁻⁴ | CL=90% |
| Γ ₁₈₂ | $\phi e^{\pm} \mu^{\mp}$ | LF | [<i>h</i>] < | 3.4 | imes 10 ⁻⁵ | CL=90% |
| Γ ₁₈₃ | $\overline{K}{}^0 e^{\pm} \mu^{\mp}$ | LF | [<i>h</i>] < | 1.0 | imes 10 ⁻⁴ | CL=90% |
| Г ₁₈₄ | \overline{K}^* (892) ⁰ $e^{\pm} \mu^{\mp}$ | LF | [<i>h</i>] < | 1.0 | $\times 10^{-4}$ | CL=90% |
| | | | | | | |

 $\Gamma_{185}~$ A dummy mode used by the fit. (16.9 ± 3.5) % $$S{=}1.1$$

- [a] This is a weighted average of D^{\pm} (44%) and D^{0} (56%) branching fractions. See " D^{+} and $D^{0} \rightarrow (\eta \text{ anything}) / (\text{total } D^{+} \text{ and } D^{0})$ " under " D^{+} Branching Ratios" in these Particle Listings.
- [b] This value averages the e^+ and μ^+ branching fractions, after making a small phase-space adjustment to the μ^+ fraction to be able to use it as an e^+ fraction; hence our ℓ^+ here is really an e^+ .
- [c] The branching fraction for this mode may differ from the sum of the submodes that contribute to it, due to interference effects. See the relevant papers.
- [d] The two experiments measuring this fraction are in serious disagreement. See the Particle Listings.
- [e] The experiments on the division of this charge mode amongst its submodes disagree, and the submode branching fractions here add up to considerably more than the charged-mode fraction.
- [f] However, these upper limits are in serious disagreement with values obtained in another experiment.
- [g] This mode is not a useful test for a $\Delta C=1$ weak neutral current because both quarks must change flavor in this decay.
- [*h*] The value is for the sum of the charge states of particle/antiparticle states indicated.

CONSTRAINED FIT INFORMATION

An overall fit to 51 branching ratios uses 122 measurements and one constraint to determine 28 parameters. The overall fit has a $\chi^2 = 64.8$ for 95 degrees of freedom.

The following off-diagonal array elements are the correlation coefficients $\langle \delta x_i \delta x_j \rangle / (\delta x_i \cdot \delta x_j)$, in percent, from the fit to the branching fractions, $x_i \equiv \Gamma_i / \Gamma_{\text{total}}$. The fit constrains the x_i whose labels appear in this array to sum to one.

| | 6 | | | | | | | | | |
|------------------------|-----|-----|-----|-----|-----|-----|-----|-----|----------|-----|
| ×8 | 0 | | | | | | | | | |
| xg | 32 | 19 | | | | | | | | |
| ×17 | 1 | 24 | 5 | | | | | | | |
| ×18 | 1 | 8 | 3 | 2 | | | | | | |
| <i>x</i> ₁₉ | 13 | 46 | 42 | 11 | 6 | | | | | |
| x ₂₀ | 1 | 5 | 3 | 1 | 24 | 8 | | | | |
| x ₂₁ | 1 | 6 | 4 | 2 | 36 | 10 | 66 | | | |
| x ₂₉ | 3 | 11 | 10 | 3 | 7 | 23 | 16 | 18 | | |
| ×37 | 3 | 12 | 11 | 3 | 2 | 26 | 3 | 3 | 6 | |
| ×46 | 1 | 3 | 2 | 1 | 18 | 5 | 33 | 51 | 9 | 3 |
| ×55 | 2 | 8 | 7 | 2 | 1 | 17 | 1 | 2 | 4 | 32 |
| ×64 | 1 | 3 | 2 | 1 | 16 | 5 | 30 | 46 | 8 | 2 |
| ×68 | 1 | 3 | 2 | 1 | 17 | 5 | 58 | 47 | 11 | 2 |
| x ₇₁ | 1 | 2 | 2 | 1 | 13 | 4 | 24 | 37 | 7 | 2 |
| ×74 | 1 | 4 | 2 | 1 | 21 | 6 | 39 | 60 | 10 | 2 |
| ×80 | 1 | 6 | 4 | 1 | 30 | 9 | 56 | 84 | 18 | 3 |
| ×81 | 1 | 5 | 4 | 1 | 7 | 10 | 24 | 18 | 43 | 3 |
| x ₈₃ | 1 | 3 | 2 | 1 | 0 | 5 | 1 | 1 | 1 | 21 |
| ×87 | 0 | 2 | 1 | 0 | 2 | 3 | 3 | 5 | 1 | 11 |
| x ₉₈ | 0 | 2 | 1 | 0 | 7 | 3 | 13 | 20 | 4 | 3 |
| ×106 | 1 | 3 | 3 | 1 | 2 | 6 | 4 | 4 | 23 | 2 |
| ×117 | 8 | 28 | 26 | 7 | 4 | 61 | 5 | 6 | 14 | 16 |
| ×118 | 0 | 2 | 1 | 0 | 9 | 2 | 17 | 25 | 4 | 1 |
| ×119 | 1 | 4 | 3 | 1 | 14 | 6 | 26 | 39 | 7 | 2 |
| ×123 | 1 | 3 | 2 | 1 | 11 | 6 | 20 | 30 | 6 | 2 |
| ^x 140 | 0 | 2 | 1 | 0 | 11 | 3 | 20 | 30 | 5 | 1 |
| ×185 | -28 | -20 | -23 | -7 | -34 | -31 | -53 | -70 | <u> </u> | -26 |
| | Xo | Xg | XQ | X17 | X18 | ×10 | ×20 | ×21 | X20 | X37 |

| ×55 | 1 | | | | | | | | | |
|------------------|-----|------|------|------|-----------------|------------------|------|-----|-----|-----|
| ^x 64 | 23 | 1 | | | | | | | | |
| ×68 | 24 | 1 | 21 | | | | | | | |
| x ₇₁ | 43 | 1 | 17 | 17 | | | | | | |
| ×74 | 30 | 1 | 7 | 28 | 22 | | | | | |
| ×80 | 43 | 2 | 38 | 40 | 31 | 50 | | | | |
| ×81 | 9 | 2 | 8 | 14 | 7 | 11 | 17 | | | |
| ×83 | 1 | 7 | 0 | 0 | 0 | 0 | 1 | 1 | | |
| ×87 | 9 | 4 | 2 | 2 | 4 | 3 | 4 | 1 | 2 | |
| <i>x</i> 98 | 40 | 1 | 9 | 9 | 17 | 12 | 17 | 4 | 1 | 4 |
| ×106 | 2 | 1 | 2 | 2 | 2 | 2 | 4 | 10 | 0 | 0 |
| ×117 | 3 | 10 | 3 | 3 | 2 | 4 | 6 | 6 | 3 | 2 |
| ×118 | 13 | 0 | 11 | 12 | 9 | 15 | 21 | 5 | 0 | 1 |
| ×119 | 20 | 1 | 18 | 18 | 14 | 23 | 33 | 7 | 0 | 2 |
| x ₁₂₃ | 15 | 1 | 14 | 14 | 11 | 18 | 25 | 6 | 0 | 2 |
| ×140 | 15 | 1 | 14 | 14 | 11 | 18 | 25 | 6 | 0 | 1 |
| ×185 | -68 | -21 | -33 | -38 | -45 | -43 | -64 | -38 | -14 | -23 |
| | ×46 | ×55 | ×64 | ×68 | x ₇₁ | ×74 | ×80 | ×81 | ×83 | ×87 |
| ×106 | 1 | | | | | | | | | |
| ×117 | 2 | 4 | | | | | | | | |
| ×118 | 5 | 1 | 2 | | | | | | | |
| ×119 | 8 | 2 | 4 | 10 | | | | | | |
| x ₁₂₃ | 6 | 1 | 3 | 8 | 12 | | | | | |
| ×140 | 6 | 1 | 2 | 8 | 12 | 9 | | | | |
| ×185 | -34 | -25 | -19 | -18 | -30 | -24 | -23 | | | |
| | ×98 | ×106 | ×117 | ×118 | <i>×</i> 119 | x ₁₂₃ | ×140 | | | |

D⁰ BRANCHING RATIOS

See the "Note on *D* Mesons" in the D^{\pm} Listings.

Some older now obsolete results have been omitted from these Listings.

----- Inclusive modes ------

| $\Gamma(e^+ \text{ anything}) / \Gamma_{\text{total}}$ | | | | Γ_1/Γ |
|--|-------------|----------------------|----------------|----------------------------|
| VALUE | <u>EVTS</u> | DOCUMENT ID | TECN | COMMENT |
| 0.0675 ± 0.0029 OUR AVERA | AGE | | | |
| $0.069 \ \pm 0.003 \ \pm 0.005$ | 1670 | ALBRECHT | 96c ARG | $e^+ e^- pprox$ 10 GeV |
| $0.0664 \!\pm\! 0.0018 \!\pm\! 0.0029$ | 4609 | ¹³ KUBOTA | 96B CLE2 | $e^+e^-pprox~\Upsilon(4S)$ |
| $0.075 \pm 0.011 \pm 0.004$ | 137 | BALTRUSAIT. | 85B MRK3 | e^+e^- 3.77 GeV |
| • • • We do not use the foll | owing data | for averages, fits, | limits, etc. • | • • |

| 0.15 ± 0.05 | | AGUILA | R 87E H | HYBR $\pi p, pp$ 360, 400 |
|---|------------------------------|----------------------------------|---------------|---|
| 0.055 ± 0.037 | | 12 SCHINE | DLER 81 | MRK2 e^+e^- 3.771 GeV |
| ¹³ KUBOTA 96B uses | s D*+ - | $\rightarrow D^0 \pi^+$ (and cha | rge conjugate | e) events in which the D^0 |
| subsequently decay | s to <i>X e</i> ⁻ | $^{+}\nu_{e}$. | | |
| $\Gamma(\mu^+ 	ext{ anything}) / \Gamma_{	ext{tc}}$ | tal | | | Γ ₂ /Γ |
| VALUE | EVTS | DOCUMENT ID | TECN | COMMENT |
| 0.066 ± 0.008 OUR FIT | - | | | |
| $0.060 \pm 0.007 \pm 0.012$ | 310 | ALBRECHT | 96c ARG | e^+e^-pprox 10 GeV |
| $\Gamma(K^- \text{anything})/\Gamma_t$ | otal | | | Г ₃ /Г |
| VALUE | <u>EVTS</u> | DOCUMENT ID | TECN | COMMENT |
| 0.53 ± 0.04 OUR AV | ERAGE | Error includes scale | factor of 1.3 | . See the ideogram below. |
| $0.546\substack{+0.039\\-0.038}$ | | ¹⁴ BARLAG | 92c ACCM | π^- Cu 230 GeV |
| $0.609\!\pm\!0.032\!\pm\!0.052$ | | COFFMAN | 91 MRK3 | e^+e^- 3.77 GeV |
| $0.42 \hspace{0.1in} \pm 0.08$ | | AGUILAR | 87e HYBR | πp, pp 360, 400 GeV |
| 0.55 ± 0.11 | 121 | SCHINDLER | 81 MRK2 | <i>е</i> ⁺ <i>е</i> ⁻ 3.771 GeV |
| 0.35 ± 0.10 | 19 | VUILLEMIN | 78 MRK1 | e ⁺ e ⁻ 3.772 GeV |

 $^{14}\,{\rm BARLAG}$ 92C computes the branching fraction using topological normalization.



 $\Gamma(\kappa^{-} anything)/\Gamma_{total}$

HTTP://PDG.LBL.GOV

| VALUE | <u>EVTS</u> | DOCUMENT ID | | TECN | COMMENT |
|--|--|--|---|---|---|
| 0.42 ± 0.05 OUR AVER | AGE | | | | |
| $0.455 \pm 0.050 \pm 0.032$ | 10 | COFFMAN | 91 | MRK3 | e^+e^- 3.77 GeV |
| 0.29 ± 0.11 | 13 | | 81 79 | MRK2 | e + e = 3.771 GeV |
| 0.57 ±0.20 | 0 | VOILLEIMIN | 10 | WINT | e' e' 5.772 Gev |
| $\Gamma(K^+$ anything)/ Γ_{tota} | h | | | | Г ₅ /Г |
| VALUE | <u>EVTS</u> | DOCUMENT ID | | <u>TECN</u> | COMMENT |
| 0.034 ± 0.006 OUR AVER | AGE | | | | |
| $0.034 \substack{+ 0.007 \\ - 0.005}$ | 1 | ⁵ BARLAG | 92C | ACCM | π^- Cu 230 GeV |
| 0.028±0.009±0.004 | | COFFMAN | 91 | MRK3 | e ⁺ e ⁻ 3.77 GeV |
| $0.03 \begin{array}{c} +0.05 \\ -0.02 \end{array}$ | | AGUILAR | 87E | HYBR | π <i>p</i> , <i>pp</i> 360, 400 GeV |
| 0.08 ±0.03 | 25 | SCHINDLER | 81 | MRK2 | e^+e^- 3.771 GeV |
| ¹⁵ BARLAG 92C comput | tes the bra | nching fraction ι | ising | topologi | cal normalization. |
| | —— s | emileptonic m | odes | | |
| | - | | | | F /F |
| $(K \ell' \nu_{\ell})/I_{total}$ | | . <i>v</i> _ + . | | c . | I 7/I |
| We average our K | $e \nu_e$ ai | nd K $\mu^+ u_{\mu}$ br | anchi | ng fract | ions, after multiplying the |
| latter by a phase-sp | ace factor | of 1.03 to be ab | le to | use it w | ith the $K^- e^+ \nu_e$ fraction. |
| Hence our ℓ^{+} here | is really a | $n e^{\top}$. | | COMME | NT |
| 0.0350±0.0017 OUR AVI | ERAGE I | Error includes sca | ale fa | ctor of 1 | 3. |
| 0.0366±0.0018 | | PDG | 98 | Our Γ(| $K^- e^+ \nu_e) / \Gamma_{total}$ |
|).0333±0.0018 | | PDG | 98 | 1.03 $	imes$ | our $\Gamma(K^- \mu^+ \nu_\mu) / \Gamma_{total}$ |
| $(K^-e^+\nu_a)/\Gamma_{total}$ | | | | | Γα/Γ |
| VALUE <u>E</u> | <u>EVTS</u> | DOCUMENT ID | | TECN | <u>COMMENT</u> |
| 0.0366±0.0018 OUR FIT | - | | | | |
| $0.034 \pm 0.005 \pm 0.004$ | 55 | ADLER | 89 | MRK3 | e ⁺ e ⁻ 3.77 GeV |
| $\Gamma(K^-e^+\nu_e)/\Gamma(K^-\pi)$ | ·+) | | | | Γ ₈ /Γ ₁₉ |
| /ALUE | EVTS | DOCUMENT ID | | TECN | COMMENT |
|).95 ±0.04 OUR FII)05 ±0.04 OUR AV/FR | | | | | |
| | 2510 ¹ | 6 REAN | 030 | CLE2 | $a^+a^- \sim r(\Lambda S)$ |
| $0.9(8 \pm 0.02) \pm 0.044$ | | | | | $E E \sim 1 + - 1$ |
| $0.978 \pm 0.027 \pm 0.044$ 0.90 $\pm 0.06 \pm 0.06$ | 584 ¹ | ⁷ CRAWFORD | 91B | CLEO | $e^+e^- \approx 10.5 \text{ GeV}$ |
| $\begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$ | 584 1 250 1 | ⁷ CRAWFORD ⁸ ANJOS | 93C 91B 89F | CLEO E691 | $e^+e^- \approx 10.5 \text{ GeV}$ Photoproduction |
| $\begin{array}{r} 0.978 \pm 0.027 \pm 0.044 \\ 0.90 \pm 0.06 \pm 0.06 \\ 0.91 \pm 0.07 \pm 0.11 \\ \text{BEAN 93C uses } K^{-}\mu \end{array}$ | $584 1 \\ 250 1 \\ \iota^+ u_{II}$ as v | 7 CRAWFORD 8 ANJOS vell as $K^- e^+ \nu_e$ | 91B 89F ever | CLEO E691 its and i | $e^+e^- \approx 10.5 \text{ GeV}$ Photoproduction makes a small phase-space |
| $\begin{array}{r} 5.978 \pm 0.027 \pm 0.044 \\ 0.90 \pm 0.06 \pm 0.06 \\ 0.91 \pm 0.07 \pm 0.11 \\ ^{16} \text{BEAN 93C uses } K^{-} \mu \\ \text{adjustment to the number} \end{array}$ | $584 1 \\ 250 1 \\ \iota^+ u_\mu$ as v | ⁷ CRAWFORD ⁸ ANJOS vell as $K^- e^+ \nu_e$ e μ^+ events to | 91B 89F ever use th | CLEO E691 Its and i | $e^+e^- \approx 10.5 \text{ GeV}$ Photoproduction makes a small phase-space e^+ events. A pole mass of |
| $\begin{array}{r} 0.978 \pm 0.027 \pm 0.044 \\ 0.90 \pm 0.06 \pm 0.06 \\ 0.91 \pm 0.07 \pm 0.11 \\ 16 \text{ BEAN 93C uses } K^- \mu \\ \text{ adjustment to the num} \\ 2.00 \pm 0.12 \pm 0.18 \text{ G} \\ 17 \text{ CRAWFORD 91B use} \end{array}$ | $584 \qquad 1$ $250 \qquad 1$ $\mu^+ \nu_{\mu} \text{ as v}$ | ⁷ CRAWFORD ⁸ ANJOS vell as $K^- e^+ \nu_e$ e μ^+ events to potained from the ν_e and $K^- \mu^+ \mu$ | 91B 89F ever use the q^2 | CLEO E691 Its and in nem as e depended | $e^+e^- \approx 10.5 \text{ GeV}$ Photoproduction makes a small phase-space e^+ events. A pole mass of ence of the decay rate. to measure a pole mass of |
| $5.978 \pm 0.027 \pm 0.044$ $0.90 \pm 0.06 \pm 0.06$ $0.91 \pm 0.07 \pm 0.11$ 16 BEAN 93C uses $K^{-}\mu$ adjustment to the num $2.00 \pm 0.12 \pm 0.18$ G 17 CRAWFORD 91B use $2.1 \pm 0.4 \pm 0.3$ C M/C | $584 \qquad 1$ $250 \qquad 1$ $u^+ \nu_{\mu} \text{ as } v$ mber of th $5eV/c^2 \text{ is } c$ $s \ K^- e^+ \nu$ | ⁷ CRAWFORD ⁸ ANJOS vell as $K^- e^+ \nu_e$ e μ^+ events to potained from the ν_e and $K^- \mu^+ \nu_\mu$ | 93C 91B 89F ever use th e q^2 $_{L}$ can | CLEO E691 Its and in nem as e depende didates | $e^+e^- \approx 10.5 \text{ GeV}$ Photoproduction makes a small phase-space e^+ events. A pole mass of ence of the decay rate. to measure a pole mass of |
| $\begin{array}{r} 0.978 \pm 0.027 \pm 0.044 \\ 0.90 \pm 0.06 \pm 0.06 \\ 0.91 \pm 0.07 \pm 0.11 \\ 16 \text{ BEAN } 93\text{C} \text{ uses } K^- \mu \\ \text{adjustment to the num} \\ 2.00 \pm 0.12 \pm 0.18 \text{ G} \\ 17 \text{ CRAWFORD } 91\text{B} \text{ use} \\ 2.1 \substack{+0.4 + 0.3 \\ -0.2 - 0.2} \text{ GeV}/c \end{array}$ | $584 \qquad 1$ $250 \qquad 1$ $u^+ \nu_{\mu} \text{ as } v$ mber of th $5eV/c^2 \text{ is } c$ $s \ K^- e^+ \nu$ $^2 \text{ from the}$ | ⁷ CRAWFORD ⁸ ANJOS vell as $K^- e^+ \nu_e$ e μ^+ events to potained from the obtained from the ν_e and $K^- \mu^+ \nu_\mu$ e q^2 dependence | 936 91B 89F ever use the q^2 ι can of th | CLEO E691 Its and in nem as e depende didates e decay | $e^+e^- \approx 10.5 \text{ GeV}$ Photoproduction makes a small phase-space e^+ events. A pole mass of ence of the decay rate. to measure a pole mass of rate. |
| $\begin{array}{r} 0.978 \pm 0.027 \pm 0.044 \\ 0.90 \pm 0.06 \pm 0.06 \\ 0.91 \pm 0.07 \pm 0.11 \\ 16 \text{ BEAN 93C uses } K^- \mu \\ \text{adjustment to the num} \\ 2.00 \pm 0.12 \pm 0.18 \text{ G} \\ 17 \text{ CRAWFORD 91B use} \\ 2.1 \substack{+0.4 + 0.3 \\ -0.2 - 0.2 \ \text{GeV}/c} \\ 18 \text{ ANJOS 89F measures} \\ \text{of the decay rate.} \end{array}$ | $584 \qquad 1$ $250 \qquad 1$ $u^+ \nu_{\mu} \text{ as } v$ mber of th $5eV/c^2 \text{ is } c$ $s \ K^- e^+ \nu$ $c^2 \text{ from the}$ $s \text{ a pole m}$ | ⁷ CRAWFORD ⁸ ANJOS vell as $K^- e^+ \nu_e$ e μ^+ events to potained from the ν_e and $K^- \mu^+ \nu_\mu$ e q^2 dependence ass of $2.1^{+0.4}_{-0.2}$ = | 91B 91B 89F ever use the q^2 $_t$ can of th ± 0.2 | CLEO E691 Ints and international control of the co | $e^+e^- \approx 10.5 \text{ GeV}$ Photoproduction makes a small phase-space e^+ events. A pole mass of ence of the decay rate. to measure a pole mass of rate. e^2 from the q^2 dependence |
| $0.978 \pm 0.027 \pm 0.044$ $0.90 \pm 0.06 \pm 0.06$ $0.91 \pm 0.07 \pm 0.11$ 16 BEAN 93C uses $K^{-}\mu$ adjustment to the num $2.00 \pm 0.12 \pm 0.18$ G 17 CRAWFORD 91B use $2.1^{+0.4}_{-0.2} - 0.2$ GeV/ c 18 ANJOS 89F measures of the decay rate. | $584 \qquad 1$ $250 \qquad 1$ $u^+ \nu_{\mu} \text{ as } v$ mber of th $5eV/c^2 \text{ is } c$ $s \ K^- e^+ \nu$ $c^2 \text{ from the}$ $s \text{ a pole m}$ | ⁷ CRAWFORD ⁸ ANJOS vell as $K^- e^+ \nu_e$ e μ^+ events to potained from the ν_e and $K^- \mu^+ \nu_\mu$ e q^2 dependence ass of $2.1^{+0.4}_{-0.2}$ = | 91B 91B 89F ever use the q^2 ι can of th \pm 0.2 | CLEO E691 its and in nem as e depended didates e decay GeV/c^2 | $e^+e^- \approx 10.5 \text{ GeV}$ Photoproduction makes a small phase-space e^+ events. A pole mass of ence of the decay rate. to measure a pole mass of rate. e^2 from the q^2 dependence |

 $\Gamma(K^-\mu^+
u_\mu)/\Gamma(K^-\pi^+)$ Γ_9/Γ_{19} DOCUMENT ID TECN COMMENT 0.84 ±0.04 OUR FIT 0.84 ± 0.04 OUR AVERAGE 95G E687 $\gamma \operatorname{Be} \overline{E}_{\gamma} = 220 \operatorname{GeV}$ ¹⁹ FRABETTI $0.852 \pm 0.034 \pm 0.028$ 1897 ²⁰ FRABETTI 931 E687 $\gamma \operatorname{Be} \overline{E}_{\gamma} = 221 \text{ GeV}$ $0.82 \pm 0.13 \pm 0.13$ 338 ²¹ CRAWFORD 91B CLEO $e^+e^- \approx 10.5 \text{ GeV}$ $0.79 \ \pm 0.08 \ \pm 0.09$ 231 ¹⁹ FRABETTI 95G extracts the ratio of form factors $f_{-}(0)/f_{+}(0) = -1.3 + \frac{3.6}{3.4} \pm 0.6$, and measures a pole mass of $1.87 \substack{+0.11 + 0.07 \\ -0.08 - 0.06}$ GeV/ c^2 from the q^2 dependence of the decay 20 FRABETTI 931 measures a pole mass of $2.1 \substack{+0.7 + 0.7 \\ -0.3 - 0.3}$ GeV/ c^2 from the q^2 dependence of the decay rate. $^{21}\,{\rm CRAWFORD}$ 91B measures a pole mass of 2.00 \pm 0.12 \pm 0.18 ${\rm GeV}/c^2$ from the q^2 dependence of the decay rate. $\Gamma(K^-\mu^+\nu_\mu)/\Gamma(\mu^+ \text{ anything})$ Γ_0/Γ_2 DOCUMENT ID TECN COMMENT 0.49 ±0.06 OUR FIT $0.472 \pm 0.051 \pm 0.040$ **KODAMA** 94 E653 π^- emulsion 600 GeV 232 • • • We do not use the following data for averages, fits, limits, etc. • • • $0.32 \ \pm 0.05 \ \pm 0.05$ 124 KODAMA 91 EMUL pA 800 GeV $\Gamma(K^{-}\pi^{0}e^{+}\nu_{e})/\Gamma_{\text{total}}$ Γ_{10}/Γ DOCUMENT ID TECN COMMENT VALUE $0.016^{+0.013}_{-0.005} \pm 0.002$ 4 ²² BAI 91 MRK3 $e^+e^- \approx 3.77$ GeV $^{22}\,{\rm BAI}$ 91 finds that a fraction $0.79^{+0.15}_{-0.17} + 0.09_{-0.03}$ of combined D^+ and D^0 decays to $\overline{K}\pi e^+\nu_e$ (24 events) are $\overline{K}^*(892)e^+\nu_e$. BAI 91 uses 56 $K^-e^+\nu_e$ events to measure a pole mass of $1.8 \pm 0.3 \pm 0.2 \text{ GeV}/c^2$ from the q^2 dependence of the decay rate. $\Gamma \big(\overline{K}{}^{0}\pi^{-}e^{+}\nu_{e}\big)/\Gamma_{\rm total}$ Γ_{11}/Γ DOCUMENT ID TECN COMMENT VALUE EVTS $0.028^{+0.017}_{-0.008}\pm 0.003$ 6 ²³ BAI 91 MRK3 $e^+e^- \approx 3.77$ GeV 23 BAI 91 finds that a fraction $0.79^{+0.15+0.09}_{-0.17-0.03}$ of combined D^+ and D^0 decays to $\overline{K}\pi e^+\nu_{\rho}$ (24 events) are $\overline{K}^*(892)e^+\nu_{\rho}$. $\Gamma(K^*(892)^-e^+\nu_e)/\Gamma(K^-e^+\nu_e)$ Γ_{18}/Γ_8 Unseen decay modes of the $K^*(892)^-$ are included. VALUE DOCUMENT ID TECN COMMENT 0.55±0.09 OUR FIT CRAWFORD 91B CLEO $e^+e^- \approx 10.5$ GeV $0.51 \pm 0.18 \pm 0.06$ $\Gamma(K^*(892)^-e^+\nu_e)/\Gamma(\overline{K}^0\pi^+\pi^-)$ Γ_{18}/Γ_{21} Unseen decay modes of the $\overline{K}^*(892)^-$ are included. VALUE DOCUMENT ID TECN COMMENT 0.37±0.06 OUR FIT ²⁴ BEAN 93C CLE2 $e^+e^- \approx \Upsilon(4S)$ $0.38 \pm 0.06 \pm 0.03$ 152 $^{24}\,{\rm BEAN}$ 93C uses ${\it K}^{*-}\,\mu^+\,\nu_\mu$ as well as ${\it K}^{*-}\,e^+\,\nu_e$ events and makes a small phase-space adjustment to the number of the μ^+ events to use them as e^+ events. HTTP://PDG.LBL.GOV Created: 6/29/1998 12:22 Page 14

 $\Gamma(K^*(892)^-\ell^+\nu_\ell)/\Gamma(\overline{K}^0\pi^+\pi^-)$ Γ_{13}/Γ_{21} This an average of the $K^*(892)^- e^+ \nu_e$ and $K^*(892)^- \mu^+ \nu_{\mu}$ ratios. Unseen decay modes of the $K^*(892)^-$ are included. VALUE _____ EVTS DOCUMENT ID TECN COMMENT • • • We do not use the following data for averages, fits, limits, etc. • • • 137 ²⁵ ALEXANDER 90B CLEO e^+e^- 10.5–11 GeV $0.24\!\pm\!0.07\!\pm\!0.06$ ²⁵ ALEXANDER 90B cannot exclude extra π^0 's in the final state. See nearby data blocks for more detailed results. $\Gamma(\overline{K}^{*}(892)^{0}\pi^{-}e^{+}\nu_{e})/\Gamma(K^{*}(892)^{-}e^{+}\nu_{e})$ Γ_{14}/Γ_{18} Unseen decay modes of the $\overline{K}^*(892)^0$ are included. DOCUMENT ID TECN COMMENT VALUE <u>CL%</u> \bullet \bullet \bullet We do not use the following data for averages, fits, limits, etc. \bullet \bullet ²⁶ CRAWFORD 91B CLEO $e^+e^- \approx 10.5$ GeV 90 < 0.64 ²⁶ The limit on $(\overline{K}^*(892)\pi)^- \mu^+ \nu_{\mu}$ below is much stronger. $\frac{\Gamma(K^{-}\pi^{+}\pi^{-}\mu^{+}\nu_{\mu})}{\sqrt{\Gamma(K^{-}\mu^{+}\nu_{\mu})}}$ $\frac{VALUE}{\sqrt{O.037}}$ $\frac{CL\%}{90}$ $\frac{DOCUMENT ID}{KODAMA}$ $\frac{TECN}{93B}$ $\frac{COMMENT}{E653}$ $\pi^{-} \text{ emulsion}$ Γ_{15}/Γ_{9} 93B E653 π^- emulsion 600 GeV $\Gamma((\overline{K}^*(892)\pi)^-\mu^+\nu_{\mu})/\Gamma(K^-\mu^+\nu_{\mu})$ Γ_{16}/Γ_{9} $\frac{DOCUMENT ID}{27}$ $\frac{DOCUMENT ID}{10}$ $\frac{TECN}{27}$ $\frac{COMMENT}{10}$ π^- emulsion VALUE 90 < 0.043 93B E653 π^- emulsion 600 GeV ²⁷ KODAMA 93B searched in $K^- \pi^+ \pi^- \mu^+ \nu_{\mu}$, but the limit includes other $(\overline{K}^*(892)\pi)^$ charge states. $\frac{\Gamma(\pi^{-}e^{+}\nu_{e})}{\Gamma_{\text{total}}}$ Γ_{17}/Γ DOCUMENT ID TECN COMMENT 0.0037±0.0006 OUR FIT $0.0039 + 0.0023 \pm 0.0004$ 7 ²⁸ ADLER 89 MRK3 e^+e^- 3.77 GeV ²⁸ This result of ADLER 89 gives $\left|\frac{V_{cd}}{V_{cs}} \cdot \frac{f_{\pm}^{\pi}(0)}{f_{\pm}^{K}(0)}\right|^{2} = 0.057 \stackrel{+0.038}{-0.015} \pm 0.005.$ $\Gamma(\pi^- e^+ \nu_e) / \Gamma(\kappa^- e^+ \nu_e)$ Γ_{17}/Γ_8 DOCUMENT ID TECN COMMENT 0.102±0.017 OUR FIT 0.101 ± 0.018 OUR AVERAGE ²⁹ FRABETTI 968 E687 γ Be, $\overline{E}_{\gamma}pprox$ 200 GeV 91 $0.101 \pm 0.020 \pm 0.003$ 95 CLE2 < 0.156 (90% CL) ³⁰ BUTLER $0.103 \!\pm\! 0.039 \!\pm\! 0.013$ 87 29 FRABETTI 96B uses both e and μ events, and makes a small correction to the μ events to make them effectively *e* events. This result gives $\left|\frac{V_{cd}}{V_{cs}}, \frac{f_{\pm}^{\pi}(0)}{f_{\pm}^{K}(0)}\right|^2 = 0.050 \pm 0.011 \pm 0.002.$ ³⁰ BUTLER 95 has 87 ± 33 $\pi^- e^+ \nu_e$ events. The result gives $|\frac{V_{cd}}{V_{cs}} \cdot \frac{f_{\pm}^{\pi}(0)}{f_{\pm}^{K}(0)}|^2 = 0.052 \pm$ $0.020 \pm 0.007.$

Page 15

Created: 6/29/1998 12:22

— Hadronic modes with a \overline{K} or $\overline{K}\overline{K}\overline{K}$ ———

| $\Gamma(\kappa^{-}\pi^{+})/\Gamma_{total}$ | | | | Г ₁₉ /Г |
|--|---|---|---|---|
| VALUE | EVTS | DOCUMENT ID | TECN | COMMENT |
| 0.0385 ± 0.0009 OUR FIT | | | | |
| 0.0388 ± 0.0009 OUR AVERA | GE | 0 .1 | | |
| $0.0381 \!\pm\! 0.0015 \!\pm\! 0.0016$ | | ³¹ ARTUSO | 98 CLE2 | $\mathrm{e^+e^-}pprox \varUpsilon(4S)$ |
| $0.0390 \pm 0.0009 \pm 0.0012$ | 5392 | ³¹ BARATE | 97c ALEP | From Z decays |
| $0.045 \pm 0.006 \pm 0.004$ | | ³² ALBRECHT | 94 ARG | $e^+e^-pprox\varUpsilon(4S)$ |
| $0.0341 \!\pm\! 0.0012 \!\pm\! 0.0028$ | 1173 | ³¹ ALBRECHT | 94F ARG | $e^+e^-pproxarepsilon(4S)$ |
| $0.0395 \pm 0.0008 \pm 0.0017$ | 4208 | ^{31,33} AKERIB | 93 CLE2 | $e^+e^-pproxarepsilon(4S)$ |
| $0.0362 \pm 0.0034 \pm 0.0044$ | | ³¹ DECAMP | 91J ALEP | From Z decays |
| $0.045\ \pm 0.008\ \pm 0.005$ | 56 | ³¹ АВАСНІ | 88 HRS | e ⁺ e ⁻ 29 GeV |
| $0.042\ \pm 0.004\ \pm 0.004$ | 930 | ADLER | 88c MRK3 | е ⁺ е ⁻ 3.77 GeV |
| 0.041 ± 0.006 | 263 | ³⁴ SCHINDLER | 81 MRK2 | e^+e^- 3.771 GeV |
| 0.043 ± 0.010 | 130 | ³⁵ PERUZZI | 77 MRK1 | e^+e^- 3.77 GeV |
| TUSO 98 use $D^*(2010)^+$ respect to the event thrus of such π^+ 's over backgro the fraction with $D^0 \rightarrow D^{32}$ ALBRECHT 94 uses D^0 r of events than used by AL ³³ This AKERIB 93 value inc 0.0008 \pm 0.0017. ³⁴ SCHINDLER 81 (MARK-2 0.24 \pm 0.02 nb. We use th ³⁵ PERUZZI 77 (MARK-1) 0.25 \pm 0.05 nb. We use th | $J_{J}, Ar D' \rightarrow D'$ st axis opened gi $K^{-}\pi^{+}$ nesons .BRECH ludes ra P measure MAF measure MAF | The results of the second sec | is both slow + direction). *(2010) ⁺ \rightarrow - π^+ branchi $\overline{\nu}_{\ell}$ decays. - $\overline{\tau}_{\ell}$ decays. - $$ | The excess number $D^0\pi^+$ events, and ng fraction. This is a different set the value is $0.0391 \pm$ nching fraction to be $5.8 \pm 0.5 \pm 0.6$ nb. This fraction to be $5.8 \pm 0.5 \pm 0.6$ nb. |
| $\Gamma(\overline{K}^{m 0}\pi^{m 0})/\Gamma(K^{-}\pi^{+})$ | _ | | | Γ ₂₀ /Γ ₁₉ |
| | <u>)</u> | DOCUMENT ID | <u>TECN</u> <u>COM</u> | MENI |
| 1.36±0.23±0.22 119 | ncludes | ANJOS 92B | E691 γ Be | 80–240 GeV |
| | | | , | _ /_ |
| $\Gamma(K^{0}\pi^{0})/\Gamma(K^{0}\pi^{+}\pi^{-})$ | | | | Γ_{20}/Γ_{21} |
| VALUE EVTS | 2 | DOCUMENT ID | <u>TECN</u> <u>COM</u> | MENT |
| | • | | | |
| $0.44 \pm 0.02 \pm 0.05 = 1042$ | - | | CIE2 + - | |
| $0.44 \pm 0.02 \pm 0.05 \qquad 1942$ | 36 | | LEZ e'e | 10.30 - 10.7 GeV |
| $0.34 \pm 0.04 \pm 0.02 \qquad 92$ | | ALDRECHI 92P | $rac{d}{d} e e$ | |
| $0.30 \pm 0.04 \pm 0.08$ 104 | ł | KINUSHITA 91 | CLEU e'e | \sim 10.7 GeV |
| ³⁰ This value is calculated fr | om nun | nbers in Table 1 of Al | BRECHT 92 | 2P. |

 $\Gamma(\overline{K}^{0}\pi^{+}\pi^{-})/\Gamma_{\text{total}}$ Γ_{21}/Γ EVTS DOCUMENT ID TECN COMMENT **OUR FIT** 0.054 ± 0.004 Error includes scale factor of 1.2. 0.055 ± 0.005 OUR AVERAGE ³⁷ ALBRECHT $0.0503 \pm 0.0039 \pm 0.0049$ 284 94F ARG $e^+e^- \approx \Upsilon(4S)$ 87 MRK3 e^+e^- 3.77 GeV $0.064\ \pm 0.005\ \pm 0.010$ ADLER ³⁸ SCHINDLER 0.052 ± 0.016 81 MRK2 e^+e^- 3.771 GeV 32 ³⁹ PERUZZI 77 MRK1 e^+e^- 3.77 GeV 0.079 ± 0.023 28 ³⁷See the footnote on the ALBRECHT 94F measurement of $\Gamma(K^-\pi^+)/\Gamma_{total}$ for the ³⁸ SCHINDLER 81 (MARK-2) measures $\sigma(e^+e^- \rightarrow \psi(3770)) \times$ branching fraction to be 0.30 \pm 0.08 nb. We use the MARK-3 (ADLER 88C) value of σ = 5.8 \pm 0.5 \pm 0.6 nb. ³⁹ PERUZZI 77 (MARK-1) measures $\sigma(e^+e^- \rightarrow \psi(3770)) \times$ branching fraction to be 0.46 \pm 0.12 nb. We use the MARK-3 (ADLER 88C) value of σ = 5.8 \pm 0.5 \pm 0.6 nb. $\Gamma(\overline{K}^{0}\pi^{+}\pi^{-})/\Gamma(K^{-}\pi^{+})$ Γ_{21}/Γ_{19} DOCUMENT ID EVTS TECN 1.41±0.10 OUR FIT Error includes scale factor of 1.2. 1.65 ± 0.17 OUR AVERAGE $1.61\!\pm\!0.10\!\pm\!0.15$ FRABETTI 94J E687 $\gamma \operatorname{Be} \overline{E}_{\gamma} = 220 \operatorname{GeV}$ 856 $\gamma N \rightarrow D^{*+}$ 1.7 ± 0.8 35 AVERY 80 SPEC 77 MRK1 e^+e^- 4.03, 4.41 GeV 2.8 ± 1.0 116 PICCOLO $\Gamma(\overline{K}^{0}\rho^{0})/\Gamma(\overline{K}^{0}\pi^{+}\pi^{-})$ Γ_{22}/Γ_{21} DOCUMENT ID TECN COMMENT 0.223 ± 0.027 OUR AVERAGE Error includes scale factor of 1.2. $\gamma\,{
m Be},\,\overline{E}_\gammapprox$ 220 GeV $0.350 \pm 0.028 \pm 0.067$ FRABETTI 94G E687 $e^+e^- \approx 10 \text{ GeV}$ $0.227 \pm 0.032 \pm 0.009$ 93D ARG ALBRECHT $0.215 \pm 0.051 \pm 0.037$ ANJOS 93 E691 γ Be 90–260 GeV $\gamma \operatorname{Be} \overline{E}_{\gamma} = 221 \text{ GeV}$ $0.20\ \pm 0.06\ \pm 0.03$ FRABETTI 92B E687 $0.12 \pm 0.01 \pm 0.07$ 87 MRK3 e^+e^- 3.77 GeV ADLER $\Gamma(\overline{K}^0 f_0(980))/\Gamma(\overline{K}^0 \pi^+ \pi^-)$ Γ_{73}/Γ_{21} Unseen decay modes of the $f_0(980)$ are included. VALUE DOCUMENT ID TECN COMMENT 0.105±0.029 OUR AVERAGE $\gamma \,\mathrm{Be},\,\overline{E}_{\gamma} pprox 220\,\,\mathrm{GeV}$ $0.131 \pm 0.031 \pm 0.034$ FRABETTI 94G E687 e^+e^-pprox 10 GeV $0.088 \pm 0.035 \pm 0.012$ ALBRECHT 93D ARG $\Gamma(\overline{K}^{0} f_{2}(1270)) / \Gamma(\overline{K}^{0} \pi^{+} \pi^{-})$ Γ_{77}/Γ_{21} Unseen decay modes of the $f_2(1270)$ are included. VALUE DOCUMENT ID <u>TECN</u> <u>COMMENT</u> 0.076±0.028 OUR AVERAGE $\gamma \, {
m Be}, \ \overline{E}_{\gamma} pprox 220 \ {
m GeV}$ $0.065 \pm 0.025 \pm 0.030$ FRABETTI 94G E687 $e^+e^- \approx 10 \text{ GeV}$ $0.088 \pm 0.037 \pm 0.014$ ALBRECHT 93D ARG $\Gamma(\overline{K}^0 f_0(1370))/\Gamma(\overline{K}^0 \pi^+ \pi^-)$ Γ_{79}/Γ_{21} Unseen decay modes of the $f_0(1370)$ are included. VALUE DOCUMENT ID TECN COMMENT 0.13 ± 0.04 OUR AVERAGE $\gamma \operatorname{Be}, \overline{E}_{\gamma} \approx 220 \, \operatorname{GeV}$ $0.123 \pm 0.035 \pm 0.049$ FRABETTI 94G E687 e^+e^-pprox 10 GeV ALBRECHT 93D ARG $0.131 \pm 0.045 \pm 0.021$ HTTP://PDG.LBL.GOV Created: 6/29/1998 12:22 Page 17

 $\Gamma(K^*(892)^-\pi^+)/\Gamma(\overline{K}^0\pi^+\pi^-)$ Γ_{80}/Γ_{21} Unseen decay modes of the $K^*(892)^-$ are included. VALUE EVTS DOCUMENT ID <u>TECN</u><u>COMMENT</u> **0.93** \pm **0.04 OUR FIT** Error includes scale factor of 1.1. 0.96 ± 0.04 OUR AVERAGE $\gamma \text{Be}, \overline{E}_{\gamma} \approx 220 \text{ GeV}$ $0.938 \pm 0.054 \pm 0.038$ FRABETTI 94G E687 $e^+e^- \approx 10 \text{ GeV}$ $1.08\ \pm 0.063 \pm 0.045$ ALBRECHT 93d ARG 93 E691 γ Be 90–260 GeV $0.720 \pm 0.145 \pm 0.185$ ANJOS 92B E687 $\gamma \operatorname{Be} \overline{E}_{\gamma} = 221 \text{ GeV}$ $0.96 \pm 0.12 \pm 0.075$ FRABETTI $0.84\ \pm 0.06\ \pm 0.08$ 87 MRK3 e^+e^- 3.77 GeV ADLER $1.05 \begin{array}{c} +0.23 \\ -0.26 \end{array} \begin{array}{c} +0.07 \\ -0.09 \end{array}$ 81 MRK2 e^+e^- 3.771 GeV 25 SCHINDLER $\Gamma(K_0^*(1430)^-\pi^+)/\Gamma(\overline{K}^0\pi^+\pi^-)$ Γ_{102}/Γ_{21} Unseen decay modes of the $\overline{K}^*_0(1430)^-$ are included. VALUE DOCUMENT ID TECN COMMENT 0.19 ± 0.05 OUR AVERAGE $0.176 \pm 0.044 \pm 0.047$ 94G E687 γ Be, $\overline{E}_{\gamma} \approx 220$ GeV FRABETTI $e^+e^- \approx 10 \text{ GeV}$ $0.208 \pm 0.055 \pm 0.034$ ALBRECHT 93d ARG $\Gamma(K_{2}^{*}(1430)^{-}\pi^{+})/\Gamma(\overline{K}^{0}\pi^{+}\pi^{-})$ Γ_{103}/Γ_{21} Unseen decay modes of the $\overline{K}_{2}^{*}(1430)^{-}$ are included. VALUE DOCUMENT ID TECN COMMENT <u>CL%</u> 93d ARG $e^+e^- \approx 10 \text{ GeV}$ <0.15 90 ALBRECHT $\Gamma(\overline{K}^0\pi^+\pi^- \text{ nonresonant})/\Gamma(\overline{K}^0\pi^+\pi^-)$ Γ_{28}/Γ_{21} VALUE DOCUMENT ID <u>TECN</u><u>COMMENT</u> 0.27 ±0.04 OUR AVERAGE $0.263 \pm 0.024 \pm 0.041$ 93 E691 γ Be 90–260 GeV ANJOS $0.26\ \pm 0.08\ \pm 0.05$ FRABETTI 92B E687 $\gamma \operatorname{Be} \overline{E}_{\gamma} = 221 \text{ GeV}$ 87 MRK3 e^+e^- 3.77 GeV $0.33 \ \pm 0.05 \ \pm 0.10$ ADLER $\Gamma(K^{-}\pi^{+}\pi^{0})/\Gamma_{\text{total}}$ Γ_{29}/Γ <u>DOCUMENT I</u>D VALUE EVTS TECN COMMENT 0.139±0.009 OUR FIT Error includes scale factor of 1.3. 0.131 ± 0.016 OUR AVERAGE 88C MRK3 e^+e^- 3.77 GeV $0.133 \!\pm\! 0.012 \!\pm\! 0.013$ 931 ADLER ⁴⁰ SCHINDLER 81 MRK2 e^+e^- 3.771 GeV 0.117 ± 0.043 37 ⁴⁰SCHINDLER 81 (MARK-2) measures $\sigma(e^+e^- \rightarrow \psi(3770)) \times$ branching fraction to be 0.68 \pm 0.23 nb. We use the MARK-3 (ADLER 88C) value of σ = 5.8 \pm 0.5 \pm 0.6 nb. $\Gamma(K^-\pi^+\pi^0)/\Gamma(K^-\pi^+)$ Γ_{29}/Γ_{19} VALUE **EVTS** <u>DOCUMENT I</u>D TECN COMMENT **3.62±0.23 OUR FIT** Error includes scale factor of 1.4. **3.47±0.30 OUR AVERAGE** Error includes scale factor of 1.5. See the ideogram below. $3.81\!\pm\!0.07\!\pm\!0.26$ 10k BARISH 96 CLE2 $e^+e^- \approx \Upsilon(4S)$ ⁴¹ ALBRECHT 92P ARG e^+e^-pprox 10 GeV $3.04 \pm 0.16 \pm 0.34$ 931 $4.0 \pm 0.9 \pm 1.0$ 69 ALVAREZ 91B NA14 Photoproduction 91 CLEO $e^+e^- \sim 10.7$ GeV 1050 **KINOSHITA** $2.8\ \pm 0.14 \pm 0.52$ 84 E691 SUMMERS Photoproduction 4.2 ± 1.4 41 HTTP://PDG.LBL.GOV Page 18 Created: 6/29/1998 12:22

 41 This value is calculated from numbers in Table 1 of ALBRECHT 92P.



 $\Gamma(\overline{K}^{*}(892)^{0}\pi^{0})/\Gamma(K^{-}\pi^{+}\pi^{0})$ Γ_{81}/Γ_{29} Unseen decay modes of the $\overline{\kappa}^*(892)^0$ are included. VALUE DOCUMENT ID TECN COMMENT 0.227±0.027 OUR FIT 0.221 ± 0.029 OUR AVERAGE $0.248 \pm 0.047 \pm 0.023$ γ Be, $E_{\gamma} pprox$ 220 GeV FRABETTI 94G E687 $0.213 \pm 0.027 \pm 0.035$ ANJOS $\gamma \operatorname{Be}$ 90–260 GeV 93 E691 $0.20 \pm 0.03 \pm 0.05$ ADLER 87 MRK3 e^+e^- 3.77 GeV $\Gamma(K^{-}\pi^{+}\pi^{0} \text{ nonresonant})/\Gamma(K^{-}\pi^{+}\pi^{0})$ Γ_{33}/Γ_{29} VALUE <u>DOCUMENT</u> ID EVTS TECN COMMENT 0.049 ± 0.018 OUR AVERAGE Error includes scale factor of 1.1. $0.101 \pm 0.033 \pm 0.040$ FRABETTI 94G E687 $\gamma\,{
m Be},~E_\gammapprox$ 220 GeV γ Be 90–260 GeV $0.036 \pm 0.004 \pm 0.018$ ANJOS 93 E691 $0.09\ \pm 0.02\ \pm 0.04$ ADLER 87 MRK3 e^+e^- 3.77 GeV • • • We do not use the following data for averages, fits, limits, etc. • • • 0.51 ± 0.22 21 **SUMMERS** 84 E691 Photoproduction $\Gamma(\overline{K}^*(892)^0\pi^0)/\Gamma(\overline{K}^0\pi^0)$ Γ_{81}/Γ_{20} Unseen decay modes of the $\overline{K}^*(892)^0$ are included. <u>VALUE</u> DOCUMENT ID EVTS TECN COMMENT Error includes scale factor of 1.1. 1.49±0.23 OUR FIT $1.65^{+0.39}_{-0.31}\pm0.20$ 93B CLE2 $\overline{K}^0 \pi^0 \pi^0$ Dalitz plot PROCARIO 122 $\Gamma(\overline{K}_{2}^{*}(1430)^{\mathbf{0}}\pi^{\mathbf{0}})/\Gamma(\overline{K}^{*}(892)^{\mathbf{0}}\pi^{\mathbf{0}})$ Γ_{104}/Γ_{81} Unseen decay modes of the $\overline{K}_{2}^{*}(1430)^{0}$ and $\overline{K}^{*}(892)^{0}$ are included. DOCUMENT ID VALUE <u>CL%</u> TECN COMMENT 93B CLE2 $\overline{K}^0 \pi^0 \pi^0$ Dalitz plot <0.12 90 PROCARIO $\Gamma(\overline{K}^0 \pi^0 \pi^0 \text{ nonresonant}) / \Gamma(\overline{K}^0 \pi^0)$ Γ_{36}/Γ_{20} EVTS VALUE DOCUMENT ID TECN COMMENT 93B CLE2 $\overline{K}^0 \pi^0 \pi^0$ Dalitz plot $0.37 \pm 0.08 \pm 0.04$ 76 PROCARIO $\Gamma(K^{-}\pi^{+}\pi^{+}\pi^{-})/\Gamma_{\text{total}}$ Γ_{37}/Γ DOCUMENT ID VALUE EVTS TECN COMMENT 0.076 ±0.004 OUR FIT Error includes scale factor of 1.1. 0.075 ± 0.006 OUR AVERAGE Error includes scale factor of 1.3. See the ideogram below. ⁴² ALBRECHT $e^+e^- \approx \Upsilon(4S)$ $0.079 \ \pm 0.015 \ \pm 0.009$ 94 ARG ⁴³ ALBRECHT $0.0680 \pm 0.0027 \pm 0.0057$ 1430 94F ARG $e^+e^- \approx \Upsilon(4S)$ 88C MRK3 e^+e^- 3.77 GeV 992 ADLER $0.091 \pm 0.008 \pm 0.008$ ⁴⁴ SCHINDLER 81 MRK2 e^+e^- 3.771 GeV $0.117\ \pm 0.025$ 185 ⁴⁵ PERUZZI 44 77 MRK1 e^+e^- 3.77 GeV 0.062 ± 0.019 ⁴²ALBRECHT 94 uses D^0 mesons from $\overline{B}^0 \rightarrow D^{*+} \ell^- \overline{\nu}_{\ell}$ decays. This is a different set of events than used by ALBRECHT 94F. 43 See the footnote on the ALBRECHT 94F measurement of $\Gamma(K^-\pi^+)/\Gamma_{total}$ for the method used. ⁴⁴SCHINDLER 81 (MARK-2) measures $\sigma(e^+e^- \rightarrow \psi(3770)) \times$ branching fraction to be 0.68 \pm 0.11 nb. We use the MARK-3 (ADLER 88C) value of $\sigma = 5.8 \pm 0.5 \pm 0.6$ nb.

HTTP://PDG.LBL.GOV

Created: 6/29/1998 12:22

⁴⁵ PERUZZI 77 (MARK-1) measures $\sigma(e^+ e^- \rightarrow \psi(3770)) \times \text{branching fraction to be}$ 0.36 ± 0.10 nb. We use the MARK-3 (ADLER 88C) value of $\sigma = 5.8 \pm 0.5 \pm 0.6$ nb.



• • • We do not use the following data for averages, fits, limits, etc. • • • $0.98 \pm 0.12 \pm 0.10$ ALVAREZ 91B NA14 Photoproduction

 $\Gamma(K^-\pi^+\rho^0$ 3-body)/ $\Gamma(K^-\pi^+\pi^+\pi^-)$ Γ_{39}/Γ_{37} We rely on the MARK III and E691 full amplitude analyses of the $K^-\pi^+\pi^+\pi^$ channel for values of the resonant substructure. VALUE EVTS DOCUMENT ID TECN COMMENT 0.063 ± 0.028 OUR AVERAGE $0.05\ \pm 0.03\ \pm 0.02$ ANJOS 92C E691 γ Be 90–260 GeV COFFMAN 92B MRK3 e^+e^- 3.77 GeV $0.084 \pm 0.022 \pm 0.04$ • • We do not use the following data for averages, fits, limits, etc. • • • ⁴⁶ ALVAREZ $0.77 \ \pm 0.06 \ \pm 0.06$ 91B NA14 Photoproduction $0.85 \begin{array}{c} +0.11 \\ -0.22 \end{array}$ 77 MRK1 e^+e^- 4.03, 4.41 GeV PICCOLO 180 ⁴⁶ This value is for ρ^0 (K⁻ π^+)-nonresonant. ALVAREZ 91B cannot determine what fraction of this is $K^{-}a_{1}(1260)^{+}$. $\Gamma(\overline{K}^{*}(892)^{0}\rho^{0})/\Gamma(K^{-}\pi^{+}\pi^{+}\pi^{-})$ $\Gamma_{86} / \Gamma_{37}$ Unseen decay modes of the $\overline{K}^*(892)^0$ are included. We rely on the MARK III and E691 full amplitude analyses of the $K^-\pi^+\pi^+\pi^-$ channel for values of the resonant substructure. VALUE EVTS DOCUMENT ID TECN COMMENT $0.195 \pm 0.03 \pm 0.03$ ANJOS 92C E691 γ Be 90–260 GeV • • We do not use the following data for averages, fits, limits, etc. • • • ALVAREZ 91B NA14 Photoproduction $0.34\ \pm 0.09 \pm 0.09$ 83B SPEC $\pi Be \rightarrow D^0$ 0.75 ± 0.3 5 BAILEY $0.15 \begin{array}{c} +0.16 \\ -0.15 \end{array}$ 77 MRK1 e⁺e⁻ 4.03, 4.41 GeV 20 PICCOLO $\Gamma(\overline{K}^*(892)^0 \rho^0 \text{ transverse}) / \Gamma(\overline{K}^- \pi^+ \pi^+ \pi^-)$ Γ_{87}/Γ_{37} Unseen decay modes of the $\overline{K}^*(892)^0$ are included. VALUE DOCUMENT ID TECN COMMENT 0.20 ±0.07 OUR FIT 92B MRK3 e⁺e⁻ 3.77 GeV $0.213 \pm 0.024 \pm 0.075$ COFFMAN $\Gamma(\overline{K}^*(892)^0 \rho^0 S$ -wave)/ $\Gamma(K^- \pi^+ \pi^+ \pi^-)$ Γ_{88}/Γ_{37} Unseen decay modes of the $\overline{K}^*(892)^0$ are included. VALUE DOCUMENT ID TECN COMMENT $0.375 \pm 0.045 \pm 0.06$ ANJOS 92C E691 γ Be 90–260 GeV $\Gamma(\overline{K}^*(892)^0 \rho^0 S$ -wave long.)/ Γ_{total} Γ_{89}/Γ Unseen decay modes of the $\overline{K}^*(892)^0$ are included. <u>VALUE</u> DOCUMENT ID TECN COMMENT <u>CL%</u> 92B MRK3 e⁺e⁻ 3.77 GeV < 0.003 90 COFFMAN $\Gamma(\overline{K}^*(892)^0 \rho^0 P$ -wave)/ Γ_{total} Γ_{90}/Γ Unseen decay modes of the $\overline{K}^*(892)^0$ are included. DOCUMENT ID VALUE CL% TECN COMMENT 92B MRK3 e⁺e⁻ 3.77 GeV COFFMAN < 0.003 90 • • We do not use the following data for averages, fits, limits, etc. < 0.009 90 ANJOS 92C E691 γ Be 90–260 GeV

| $\Gamma(\overline{K}^*(892)^0 \rho^0 D w$ | ave)/Г(<i>K</i> - | $\pi^+\pi^+\pi^-)$ | | | Г | 91/Г ₃₇ |
|--|----------------------------|-----------------------------|-------------|-------------|---|--------------------------------|
| Unseen decay m | odes of the <i>K</i> | *(892) ⁰ are inc | luded | | ~~~~ | |
| | | DOCUMENT ID | 00.0 | <u>TECN</u> | <u>COMMENT</u> | |
| $0.255 \pm 0.045 \pm 0.00$ | | ANJOS | 92C | E091 | γ Be 90–260 GeV | |
| $\Gamma(K^{-}\pi^{+}f_{0}(980))/$ | Γ _{total} | | | | | Г96/Г |
| VALUE | CL% | DOCUMENT ID | | TECN | COMMENT | , |
| <0.011 | 90 | ANJOS | 92C | E691 | γ Be 90–260 GeV | |
| $\Gamma(\overline{W}^*(000))$ $\Gamma(000)$ | | | | | | с /с |
| I (K*(892)* f 0(980) |)/I total | * | (| | | 197/1 |
| Unseen decay m | odes of the K | $(892)^{\circ}$ and t_{0} | (980) | are incl | uded. | |
| VALUE | <u> </u> | DOCUMENT ID | | <u>TECN</u> | <u>COMMENT</u> | |
| <0.007 | 90 | ANJOS | 92C | E691 | γ Be 90–260 GeV | |
| $\Gamma(K^{-}a_{1}(1260)^{+})/$ | $\Gamma(K^-\pi^+\pi^-)$ | $^{+}\pi^{-})$ | | | Γ | 75/Г37 |
| Unseen decay m | odes of the a ₁ | (1260) ⁺ are in | clude | d. | | |
| VALUE | | DOCUMENT ID | | TECN | <u>COMMENT</u> | |
| 0.97 \pm 0.14 OUR AV | ERAGE | | | | | |
| $0.94 \pm 0.13 \pm 0.20$ | | ANJOS | 9 2C | E691 | $\gamma \operatorname{Be} 90-260 \text{ GeV}$ | |
| $0.984 \pm 0.048 \pm 0.16$ | | COFFMAN | 92 B | MRK3 | e ⁺ e ⁻ 3.77 GeV | |
| $\Gamma(K^{-}a_{2}(1320)^{+})/$ | [total | | | | | Γ 7 9/Γ |
| Unseen decay m | odes of the <i>a</i> | $(1320)^+$ are in | clude | d | | - 707 - |
| VALUE | | DOCUMENT ID | ciuuc | TFCN | COMMENT | |
| < 0.002 | 90 | ANIOS | 920 | F691 | | |
| • • • We do not use t | he following o | lata for average | s, fits | , limits, | etc. • • • | |
| <0.006 | 90 | COFFMAN | 92 B | MRK3 | e^+e^- 3.77 GeV | |
| $\Gamma(1/(1070) - +)/$ | | + _) | | | F | /= |
| $(n_1(12/0) \pi')/$ | $(\wedge \pi' \pi)$ | ·π) | | | | 98/137 |
| Unseen decay m | odes of the K | 1(1270) are ir | nclude | ed. The | MARK3 and E691 | experi- |
| ments disagree c | cl % | ere. | | TECN | COMMENT | |
| 0.14 ±0.04 OUR I | FIT | DOCOMENTID | | TLCN | COMMENT | |
| 0.194±0.056±0.088 | 3 | COFFMAN | 9 2B | MRK3 | e ⁺ e ⁻ 3.77 GeV | |
| • • • We do not use t | he following o | lata for averages | s, fits | , limits, | etc. • • • | |
| <0.013 | 90 | ANJOS | 9 2C | E691 | γ Be 90–260 GeV | |
| $\Gamma(1/(1,00) - +)/$ | - | | | | | - /- |
| $(K_1(1400)^-\pi^+)/$ | total | | | | | 1 99/1 |
| VALUE | <u>CL%</u> | DOCUMENT ID | | TECN | COMMENT | |
| <0.012 | 90 | COFFMAN | 92 B | MRK3 | e ⁺ e ⁻ 3.77 GeV | |
| $\Gamma(K^*(1410) = \pi^+)/$ | | | | | | Γ101 /Γ |
| | | DOCUMENT ID | | TECN | COMMENT | 1017. |
| <pre>/ALUE</pre> | <u> </u> | | 02B | MRK3 | e^+e^- 3 77 CeV | |
| | 50 | | 520 | WITCH S | | |
| $\Gamma(\overline{K}^{*}(892)^{0}\pi^{+}\pi^{-1})$ | total)/Γ(<i>K</i> ` | $(\pi^{+}\pi^{+}\pi^{-})$ | | | Γ _i | ₃₂ /Г ₃₇ |
| This includes \overline{K}^* | $(892)^0 \rho^0$, et | c. The next ent | ry giv | es the s | pecifically 3-body f | raction. |
| Unseen decay m | odes of the \overline{K} | *(892) ⁰ are inc | luded | | | |
| VALUE | | DOCUMENT ID | | TECN | COMMENT | |
| $0.30 \pm 0.06 \pm 0.03$ | | ANJOS | 9 2C | E691 | $\gamma\mathrm{Be}$ 90–260 GeV | |
| | | | | | | |
| HTTP://PDG.LBL | .GOV | Page 23 | | Crea | ted: 6/29/1998 | 12:22 |

 $\Gamma(\overline{K}^{*}(892)^{0}\pi^{+}\pi^{-}3\text{-body})/\Gamma(K^{-}\pi^{+}\pi^{+}\pi^{-})$ Γ_{83}/Γ_{37} Unseen decay modes of the $\overline{K}^*(892)^0$ are included. VALUE DOCUMENT ID TECN COMMENT 0.19 ±0.04 OUR FIT 0.18 \pm 0.04 OUR AVERAGE $0.165 \pm 0.03 \pm 0.045$ ANJOS 92C E691 γ Be 90–260 GeV COFFMAN 92B MRK3 e^+e^- 3.77 GeV $0.210 \pm 0.027 \pm 0.06$ $\Gamma(K^-\pi^+\pi^+\pi^- \text{ nonresonant})/\Gamma(K^-\pi^+\pi^+\pi^-)$ Γ_{45}/Γ_{37} VALUE DOCUMENT ID <u>TECN</u> <u>COMMENT</u> 0.233 ± 0.032 OUR AVERAGE $0.23\ \pm 0.02\ \pm 0.03$ ANJOS 92C E691 γ Be 90–260 GeV 92B MRK3 e⁺e⁻ 3.77 GeV $0.242 \pm 0.025 \pm 0.06$ COFFMAN $\Gamma(\overline{K}^{0}\pi^{+}\pi^{-}\pi^{0})/\Gamma_{\text{total}}$ Γ_{46}/Γ VALUE DOCUMENT ID TECN COMMENT EVTS 0.100±0.012 OUR FIT 92B MRK3 e⁺e⁻ 3.77 GeV $0.103 \pm 0.022 \pm 0.025$ 140 COFFMAN • • • We do not use the following data for averages, fits, limits, etc. • • • $0.134^{+0.032}_{-0.033}$ ⁴⁷ BARLAG 92C ACCM π^- Cu 230 GeV ⁴⁷ BARLAG 92C computes the branching fraction using topological normalization. $\Gamma(\overline{K}^{0}\pi^{+}\pi^{-}\pi^{0})/\Gamma(\overline{K}^{0}\pi^{+}\pi^{-})$ Γ_{46}/Γ_{21} VALUE DOCUMENT ID TECN COMMENT EVTS 1.84±0.20 OUR FIT 1.86 ± 0.23 OUR AVERAGE ⁴⁸ ALBRECHT 92P ARG $e^+e^- \approx 10 \text{ GeV}$ $1.80 \pm 0.20 \pm 0.21$ 190 $2.8 \pm 0.8 \pm 0.8$ 46 ANJOS 92C E691 γ Be 90–260 GeV $1.85\!\pm\!0.26\!\pm\!0.30$ 158 **KINOSHITA** 91 CLEO $e^+e^- \sim 10.7$ GeV 48 This value is calculated from numbers in Table 1 of ALBRECHT 92P. $\Gamma(\overline{K}^{0}\eta)/\Gamma(K^{-}\pi^{+})$ Γ_{68}/Γ_{19} Unseen decay modes of the η are included. DOCUMENT ID TECN COMMENT VALUE CL% • • • We do not use the following data for averages, fits, limits, etc. • • • ALBRECHT 89D ARG e^+e^- 10 GeV < 0.64 90 $\Gamma(\overline{K}^0\eta)/\Gamma(\overline{K}^0\pi^0)$ Γ_{68}/Γ_{20} Unseen decay modes of the η are included. VALUE EVTS DOCUMENT ID TECN COMMENT 0.33±0.04 OUR FIT $0.32 \pm 0.04 \pm 0.03$ 225 PROCARIO 93B CLE2 $\eta \rightarrow \gamma \gamma$ $\Gamma(\overline{K}^{0}\eta)/\Gamma(\overline{K}^{0}\pi^{+}\pi^{-})$ Γ_{68}/Γ_{21} Unseen decay modes of the η are included. VALUE DOCUMENT ID <u>TECN</u> <u>COMMENT</u> EVTS 0.130 ± 0.017 OUR FIT 93B CLE2 $\eta \rightarrow \pi^+ \pi^- \pi^0$ $0.14 \pm 0.02 \pm 0.02$ PROCARIO 80

| $\Gamma(\overline{K}^{0}\omega)/\Gamma(K^{-}\pi^{+})$ | | | | Γ ₇₁ /Γ ₁₉ |
|--|--|-------------|-------------|--|
| Unseen decay modes of the ω | are included. | | TECN | COMMENT |
| <u>VALUE</u> 0 54 + 0 09 OUR FIT | DOCUMENT ID | | TECN | COMMENT |
| $1.00 \pm 0.36 \pm 0.20$ | ALBRECHT | 89 D | ARG | e^+e^- 10 GeV |
| $\frac{\Gamma(\overline{K}^{0}\omega)/\Gamma(\overline{K}^{0}\pi^{+}\pi^{-})}{\text{Unseen decay modes of the }\omega}$ $\frac{VALUE}{EVTS}$ | are included. DOCUMENT ID | | <u>TECN</u> | Γ ₇₁ /Γ ₂₁ |
| 0.33±0.09 OUR AVERAGE Error i | ncludes scale fac | ctor o | of 1.1. | |
| $0.29 \pm 0.08 \pm 0.05$ 16 49 | ALBRECHT | 9 2P | ARG | $e^+e^- \approx 10 \text{ GeV}$ |
| $0.54 \pm 0.14 \pm 0.16$ 40 | KINOSHITA | 91 | CLEO | $e^+e^- \sim 10.7$ GeV |
| ⁴⁹ This value is calculated from nur | nbers in Table 1 | of A | LBRECH | HT 92P. |
| $\Gamma(\overline{K}^{0}\omega)/\Gamma(\overline{K}^{0}\pi^{+}\pi^{-}\pi^{0})$ Unseen decay modes of the ω | are included. | | | Γ ₇₁ /Γ ₄₆ |
| VALUE | DOCUMENT ID | | TECN | COMMENT |
| 0.21 ±0.04 OUR FIT 0.220±0.048±0.0116 | COFFMAN | 92 B | MRK3 | e^+e^- 3.77 GeV |
| $\Gamma(\overline{K}^{0}\eta'(958))/\Gamma(\overline{K}^{0}\pi^{+}\pi^{-})$ | | | | Γ ₇₂ /Γ ₂₁ |
| Unseen decay modes of the η' | (958) are includ | ed. | | |
| VALUE EVTS | DOCUMENT ID | | TECN | COMMENT |
| | | 00- | | / + - 0 |
| $0.31 \pm 0.02 \pm 0.04$ 594 | PROCARIO | 93B | CLE2 | $\eta' \rightarrow \eta \pi + \pi$, $\rho^{\circ} \gamma$ |
| 0.37±0.13±0.06 18 50 | ALBRECHI | 92P | ARG | $e^+e^- \approx 10 \text{ GeV}$ |
| ⁵⁰ This value is calculated from nur | nbers in Table 1 | of A | LBRECH | HT 92P. |
| $\Gamma(K^*(892)^-\rho^+)/\Gamma(\overline{K}{}^0\pi^+\pi^-\pi^-)$ | π ⁰) | | | Г ₉₂ /Г ₄₆ |
| Unseen decay modes of the K^2 | $^{*}(892)^{-}$ are inc | luded | l. | |
| VALUE | DOCUMENT ID | | TECN | COMMENT |
| $0.606 \pm 0.188 \pm 0.126$ | COFFMAN | 92 B | MRK3 | e^+e^- 3.77 GeV |
| $\Gamma(K^*(892)^- ho^+ \text{longitudinal})/\Gamma$ | $(\overline{K}^0\pi^+\pi^-\pi^0$ | ') | | Г ₉₃ /Г ₄₆ |
| Unseen decay modes of the K^2 | *(892) [—] are inc | ludec | | |
| VALUE | DOCUMENTID | | TECN | |
| 0.290 ± 0.111 | COFFMAN | 9 2B | MRK3 | <i>e</i> ⊤ <i>e</i> [−] 3.77 GeV |
| $\Gamma(K^*(892)^- \rho^+ \text{transverse}) / \Gamma(R)$ | $\overline{K}^{0}\pi^{+}\pi^{-}\pi^{0})$ | | | Г ₉₄ /Г ₄₆ |
| Unseen decay modes of the K^{2} | *(892) [—] are inc | ludec | | COMMENT |
| | | 005 | | $\frac{COMMENT}{+} = 2.77 \text{ C V}$ |
| 0.317±0.180 | COFFMAN | 9 2B | WRK3 | e'e 3.77 Gev |
| $\Gamma(K^*(892)^- \rho^+ P\text{-wave})/\Gamma_{\text{total}}$ | *(892) [—] are inc | luded | L. | Г ₉₅ /Г |
| <u>VALUE</u> CL% | <u>DOCUMEN</u> T ID | | <u>TECN</u> | COMMENT |
| <0.015 90 51 | COFFMAN | 92B | MRK3 | e^+e^- 3.77 GeV |
| ⁵¹ Obtained using other $\overline{K}^*(892) \rho$ | P-wave limits an | d iso | spin rela | tions. |

Page 25

Created: 6/29/1998 12:22

 $\Gamma(\overline{K}^*(892)^0 \rho^0 \text{ transverse}) / \Gamma(\overline{K}^0 \pi^+ \pi^- \pi^0)$ Γ_{87}/Γ_{46} Unseen decay modes of the $\overline{K}^*(892)^0$ are included. DOCUMENT ID VALUE TECN COMMENT 0.15 ±0.06 OUR FIT 92B MRK3 e^+e^- 3.77 GeV 0.126 ± 0.111 COFFMAN $\Gamma(\overline{K^0}a_1(1260)^0)/\Gamma_{\text{total}}$ Γ_{76}/Γ Unseen decay modes of the $a_1(1260)^0$ are included. CL% DOCUMENT ID TECN COMMENT VALUE 92B MRK3 e⁺e⁻ 3.77 GeV < 0.019 COFFMAN 90 $\Gamma(K_1(1270)^-\pi^+)/\Gamma(\overline{K}^0\pi^+\pi^-\pi^0)$ Γ_{98}/Γ_{46} Unseen decay modes of the $K_1(1270)^-$ are included. VALUE DOCUMENT ID <u>TECN</u> COMMENT 0.106 ± 0.028 OUR FIT 92B MRK3 e^+e^- 3.77 GeV 0.10 ±0.03 COFFMAN $\Gamma(\overline{K}_1(1400)^0\pi^0)/\Gamma_{\text{total}}$ Γ₁₀₀/Γ <u>VA</u>LUE CI % DOCUMENT ID TECN COMMENT < 0.037 92B MRK3 e^+e^- 3.77 GeV 90 COFFMAN $\Gamma(\overline{K}^*(892)^0\pi^+\pi^-3\text{-body})/\Gamma(\overline{K}^0\pi^+\pi^-\pi^0)$ Γ_{83}/Γ_{46} Unseen decay modes of the $\overline{K}^*(892)^0$ are included. VALUE DOCUMENT ID TECN COMMENT **0.14 \pm0.04 OUR FIT** Error includes scale factor of 1.1. 92B MRK3 e⁺e⁻ 3.77 GeV 0.191 ± 0.105 COFFMAN $\Gamma(\overline{K}^0\pi^+\pi^-\pi^0 \text{ nonresonant})/\Gamma(\overline{K}^0\pi^+\pi^-\pi^0)$ Γ_{53}/Γ_{46} <u>VALUE</u> TECN COMMENT DOCUMENT ID $0.210 \pm 0.147 \pm 0.150$ 92B MRK3 e⁺e⁻ 3.77 GeV COFFMAN $\Gamma(K^{-}\pi^{+}\pi^{0}\pi^{0})/\Gamma_{\text{total}}$ Γ_{54}/Γ VALUE DOCUMENT ID TECN COMMENT ⁵² ADLER 88C MRK3 e^+e^- 3.77 GeV $0.149 \!\pm\! 0.037 \!\pm\! 0.030$ 24 • • • We do not use the following data for averages, fits, limits, etc. • • • ⁵³ BARLAG 92C ACCM π^- Cu 230 GeV 0.177 ± 0.029 $0.209^{+0.074}_{-0.043}\!\pm\!0.012$ ⁵³ AGUILAR-... 87F HYBR πp, pp 360, 400 GeV 9 52 ADLER 88C uses an absolute normalization method finding this decay channel opposite a detected $\overline{D}^0 \rightarrow K^+ \pi^-$ in pure $D\overline{D}$ events. ⁵³AGUILAR-BENITEZ 87F and BARLAG 92C compute the branching fraction using topological normalization. They do not distinguish the presence of a third π^0 , and thus are not included in the average. $\Gamma(K^{-}\pi^{+}\pi^{+}\pi^{-}\pi^{0})/\Gamma(K^{-}\pi^{+})$ Γ_{55}/Γ_{19} VALUE DOCUMENT ID TECN COMMENT 1.05 ± 0.10 OUR FIT ⁵⁴ ALBRECHT $0.98 \pm 0.11 \pm 0.11$ 225 92P ARG $e^+e^- \approx 10 \text{ GeV}$

 54 This value is calculated from numbers in Table 1 of ALBRECHT 92P.

HTTP://PDG.LBL.GOV Page 26 Created: 6/29/1998 12:22

| $\Gamma(K^-\pi^+\pi^+\pi^-\pi^0)$ | /Γ(<i>K</i> ⁻ π | $(\pi^+\pi^+\pi^-)$ | TECN | COMMENT | Г <u>55</u> /Г ₃₇ |
|--|---|--|------------------------------|---|-----------------------------------|
| 0.54±0.05 OUR FIT | EVIS | DOCUMENT ID | TECN | COMMENT | |
| 0.56 ± 0.07 OUR AVER | AGE | | | | |
| $0.55 \!\pm\! 0.07 \!+\! 0.12 \\ -\! 0.09$ | 167 | KINOSHITA | 91 CLEO | $e^+ e^- \sim 10$ | .7 GeV |
| $0.57 \pm 0.06 \pm 0.05$ | 180 | ANJOS | 90D E691 | Photoproduc | tion |
| $(\overline{K}^*(892)^0 \pi^+ \pi^- \pi)^{-1}$ | τ ⁰)/Γ(<i>Κ</i> | $-\pi^{+}\pi^{+}\pi^{-}\pi^{0}$ | | | Γ ₁₀₅ /Γ ₅₅ |
| Unseen decay mc | odes of the | $\overline{K}^*(892)^0$ are inc | luded. <i>TECN</i> | COMMENT | |
| 0.45±0.15±0.15 | | ANJOS | 90D E691 | Photoproduc | tion |
| Г(К *(892) ⁰ η)/Г(К | $(-\pi^{+})$ | | | | Г ₁₀₆ /Г ₁₉ |
| Unseen decay mo | des of the | $\overline{K}^*(892)^{m 0}$ and η | are included. | | |
| | <u>EVTS</u> | DOCUMENT ID | TECN | COMMENT | |
| 0.49 ± 0.12 OOK FIT | 4.6 | | | + | / |
| $0.58 \pm 0.19 - 0.28$ | 46 | KINOSHITA | 91 CLEO | $e^+e^- \sim 10.$ | / GeV |
| Γ(Κ *(892) ⁰ η)/Γ(Κ | $(-\pi^+\pi^0)$ |) | | | Г ₁₀₆ /Г ₂₉ |
| Unseen decay mo | des of the | $\overline{K}^*(892)^{m 0}$ and η | are included. | | |
| VALUE | <u>EVTS</u> | DOCUMENT ID | TECN | <u>COMMENT</u> | |
| 0.134 ± 0.034 OUR FIT | 214 | PROCARIO | 03⊵ CLE2 | <u>k</u> *0 " k | $-\pi + 1$ |
| .13 ±0.02 ±0.03 | 214 | PROCARIO | 93B CLEZ | $\kappa \eta \to \kappa$ | π · γ · γ · γ |
| $\Gamma(K^-\pi^+\omega)/\Gamma(K^-)$ | $\pi^+)$ | | | | Γ ₁₀₇ /Γ ₁₉ |
| Unseen decay mo | des of the | ω are included. | TECN | COMMENT | |
| $78 \pm 0.12 \pm 0.10$ | <u>EV15</u> | 55 ALBRECHT | | comment | |
| 55 This value is calcula | 99 ated from | numbers in Table 1 | of ALBREC | | JGev |
| | | | | JIII 92F. | _ |
| ⁻ (<i>K</i> *(892) ⁰ ω)/Γ(<i>k</i> | $(-\pi^{+})$ | _ | | | Γ ₁₀₈ /Γ ₁₉ |
| Unseen decay mo | des of the | $\overline{K}^*(892)^0$ and ω | are included. | | |
| <u>/////////////////////////////////////</u> | <u>EVIS</u> | 56 AL RECUT | <u>1ECN</u> | $\frac{COMMENT}{2} \rightarrow 10$ | |
| 56 | 17 | | 92P ARG | e'e ≈ 10 | JGev |
| ^{oo} This value is calcula | ated from | numbers in Table I | . of ALBREC | HT 92P. | |
| $\overline{(K^*(892)^0\omega)}/\Gamma(K)$ | $(-\pi^{+}\pi^{+})$ | $\pi^{-}\pi^{0}$ | | | Г ₁₀₈ /Г ₅₅ |
| Unseen decay mo | des of the | $\overline{K}^*(892)^0$ and ω | are included. | | |
| VALUE | <u> </u> | DOCUMENT ID | <u>TECN</u> | <u>COMMENT</u> | |
| • • We do not use the | ne tollowin | g data for average | s, fits, limits, | etc. ● ● ● | |
| <0.44 | 90 | ⁵⁷ ANJOS | 90D E691 | Photoproduc | tion |
| ⁵⁷ Recovered from the malization consister | e publishec nt. | l limit, $\Gamma(\overline{K}^*(892))$ | $^{0}\omega)/\Gamma_{total}$ | in order to m | ake our nor- |
| Γ(<i>K</i> ⁻ π ⁺ η′(958))/Ι | Γ (<i>K</i> ⁻ π ⁺ | $\pi^+\pi^-)$ | | | Г ₁₀₉ /Г ₃₇ |
| Unseen decay mo | des of the | $\eta'(958)$ are include | led. | | |
| <u>VALUE</u> 0.093+0.014+0.019 | <u>EVTS</u> 286 | DOCUMENT ID PROCARIO | 93B CLE2 | $\frac{COMMENT}{n' \rightarrow n\pi^+}$ | $\pi - \rho^{0} \sim$ |
| V.V.V.V.T T V.VIJ | 200 | INCOMIO | JJD CLLZ | <i>4 / 1</i> / 1 | т, рт |
| HTTP://PDG.LBL. | GOV | Page 27 | Crea | ated: 6/29/2 | 1998 12:22 |
| 1 1 | | 0 | | / / | |



⁵⁹AGUILAR-BENITEZ 87F computes the branching fraction using topological normalization, and does not distinguish the presence of a third π^0 .

 $\Gamma_{62}/\Gamma_{21} = (\Gamma_{64} + \frac{1}{2}\Gamma_{74})/\Gamma_{21}$ $\Gamma(\overline{K}^{0}K^{+}K^{-})/\Gamma(\overline{K}^{0}\pi^{+}\pi^{-})$ TECN COMMEN DOCUMENT ID 0.172±0.014 OUR FIT 0.178±0.019 OUR AVERAGE $\gamma \operatorname{Be} \overline{E}_{\gamma} = 221 \text{ GeV}$ $0.20\ \pm 0.05\ \pm 0.04$ FRABETTI 92B E687 47 CLEO $e^+e^- \approx 10.5$ GeV 0.170 ± 0.022 136 AMMAR 91 CLEO e^+e^- near $\Upsilon(4S)$ 0.24 ± 0.08 BEBEK 86 e^+e^- 10 GeV 85b ARG 0.185 ± 0.055 52 ALBRECHT $\Gamma(\overline{K}^{0}\phi)/\Gamma(\overline{K}^{0}\pi^{+}\pi^{-})$ Γ_{74}/Γ_{21} Unseen decay modes of the ϕ are included. VALUE DOCUMENT ID EVTS TECN COMMENT 0.158±0.016 OUR FIT 0.156 ± 0.017 OUR AVERAGE $\gamma \operatorname{Be} \overline{E}_{\gamma} = 221 \text{ GeV}$ $0.13\ \pm 0.06\ \pm 0.02$ 13 FRABETTI 92B E687 e^+e^-pprox 10.5 GeV 0.163 ± 0.023 63 AMMAR 91 CLEO e^+e^- 10 GeV 87E ARG 0.155 ± 0.033 56 ALBRECHT 0.14 ± 0.05 29 BEBEK 86 CLEO e^+e^- near $\Upsilon(4S)$ We do not use the following data for averages, fits, limits, etc. 0.186 ± 0.052 85b ARG 26 ALBRECHT See ALBRECHT 87E $\Gamma(\overline{K}^0 K^+ K^- \text{non} - \phi) / \Gamma(\overline{K}^0 \pi^+ \pi^-)$ Γ_{64}/Γ_{21} VALUE EVTS DOCUMENT ID _____COMMENT 0.093±0.014 OUR FIT 0.088 ± 0.019 OUR AVERAGE 92B E687 $\gamma \operatorname{Be} \overline{E}_{\gamma} = 221 \operatorname{GeV}$ $0.11 \pm 0.04 \pm 0.03$ 20 FRABETTI e^+e^- 10 GeV 0.084 ± 0.020 ALBRECHT 87E ARG $\Gamma\left(K_{S}^{0}K_{S}^{0}K_{S}^{0}\right)/\Gamma\left(\overline{K}^{0}\pi^{+}\pi^{-}\right)$ Γ_{65}/Γ_{21} EVTS DOCUMENT ID TECN COMMENT 0.0154±0.0025 OUR AVERAGE $e^+e^- \approx \Upsilon(4S)$ 96B CLE2 $0.0139 \pm 0.0019 \pm 0.0024$ 61 ASNER $\gamma \operatorname{Be} \overline{E}_{\gamma} = 220$ 94J E687 $0.035\ \pm 0.012\ \pm 0.006$ 10 FRABETTI ${\sf GeV}'$ $e^+e^- \approx 10.5$ $0.016\ \pm 0.005$ AMMAR 91 CLEO 22 GeV $e^+e^- \approx 10 \text{ GeV}$ $0.017 \ \pm 0.007 \ \pm 0.005$ 5 ALBRECHT 90C ARG $\Gamma(K^+K^-K^-\pi^+)/\Gamma(K^-\pi^+\pi^+\pi^-)$ $\Gamma_{66} / \Gamma_{37}$ VALUE DOCUMENT ID TECN COMMENT $0.0028 \pm 0.0007 \pm 0.0001$ 20 FRABETTI 95C E687 $\gamma \text{Be}, \overline{E}_{\gamma} \approx 200$ GeV $\Gamma(K^+K^-\overline{K}^0\pi^0)/\Gamma_{\text{total}}$ Γ_{67}/Γ VALUE TECN COMMENT DOCUMENT ID 0.0072+0.0048 ⁶⁰ BARLAG 92C ACCM π^- Cu 230 GeV

 60 BARLAG 92C computes the branching fraction using topological normalization.

| | Pionic modes | | | | | | | |
|---|---|--|---|--|--|--|--|--|
| $\Gamma(\pi^+\pi^-)/\Gamma(K^-\pi^+)$ | | | | Γ_{111}/Γ_{19} | | | | |
| VALUE | EVTS | DOCUMENT ID | TECN | COMMENT | | | | |
| 0.0397 ± 0.0021 OUR AVE | RAGE | | | | | | | |
| $0.040\ \pm 0.002\ \pm 0.003$ | 2043 | AITALA | 98C E791 | π^- nucleus, 500 GeV | | | | |
| $0.043 \ \pm 0.007 \ \pm 0.003$ | 177 | FRABETTI | 94C E687 | $\gamma \operatorname{Be} \overline{E}_{\gamma} = 220$ | | | | |
| $0.0348 \!\pm\! 0.0030 \!\pm\! 0.0023$ | 227 | SELEN | 93 CLE2 | $e^+e^- \approx \Upsilon(4S)$ | | | | |
| $0.048\ \pm 0.013\ \pm 0.008$ | 51 | ADAMOVICH | 92 OMEG | π^- 340 GeV | | | | |
| $0.055 \ \pm 0.008 \ \pm 0.005$ | 120 | ANJOS | 91D E691 | Photoproduction | | | | |
| $0.040\ \pm 0.007\ \pm 0.006$ | 57 | ALBRECHT | 90c ARG | e^+e^-pprox 10 GeV | | | | |
| $0.050\ \pm 0.007\ \pm 0.005$ | 110 | ALEXANDER | 90 CLEO | e^+e^- 10.5–11 | | | | |
| $0.033 \ \pm 0.010 \ \pm 0.006$ | 39 | BALTRUSAIT. | 85e MRK3 | e^+e^- 3.77 GeV | | | | |
| $0.033\ \pm 0.015$ | | ABRAMS | 79D MRK2 | e^+e^- 3.77 GeV | | | | |
| $\Gamma(\pi^0\pi^0)/\Gamma(K^-\pi^+)$ | | | | Γ ₁₁₂ /Γ ₁₉ | | | | |
| VALUE E | <u>VIS</u> <u>DOC</u> | UMENT ID | <u>ECN COMN</u> | 1EN I | | | | |
| $0.022 \pm 0.004 \pm 0.004$ | 40 SEL | .EN 93 (| CLE2 e ⁺ e ⁻ | $^{-}pprox \Upsilon(4S)$ | | | | |
| $\Gamma(\pi^+\pi^-\pi^0)/\Gamma_{\rm total}$ | | | | Г ₁₁₃ /Г | | | | |
| VALUE E | <u>VTS</u> <u>DOC</u> | UMENT ID | <u>ECN</u> COMN | 1ENT | | | | |
| 0.016 \pm 0.011 OUR AVE | RAGE Error i | includes scale fact | or of 2.7. | | | | | |
| $0.0390 \substack{+0.0100 \\ -0.0095}$ | ⁶¹ BAI | RLAG 92C A | ACCM π^- C | Cu 230 GeV | | | | |
| $0.011\ \pm 0.004\ \pm 0.002$ | 10 ⁶² BAI | TRUSAIT85E | NRK3 e ⁺ e⁻ | [–] 3.77 GeV | | | | |
| ⁶¹ BARLAG 92C compute contamination by extra ⁶² All the BALTRUSAITIS | s the branching π^0 's may par S 85E events a | g fraction using to tly explain the une re consistent with | pological nor expectedly lar $\rho^0 \pi^0$. | malization. Possible rge value. | | | | |
| $\Gamma(\pi^+\pi^+\pi^-\pi^-)/\Gamma(K)$ | $(-\pi^{+}\pi^{+}\pi^{-})$ | | | [114/[37 | | | | |

| $\cdot (n n n n)/ \cdot (n$ | | <i>"</i>) | | • 114/ • 3/ |
|---------------------------------|------|---------------------|----------|--|
| VALUE | EVTS | DOCUMENT ID | TECN | COMMENT |
| 0.098 ± 0.006 OUR AVER | AGE | | | |
| $0.095\!\pm\!0.007\!\pm\!0.002$ | 814 | FRABETTI | 95C E687 | $\gamma{ m Be},\overline{E}_\gammapprox$ 200 GeV |
| $0.115\!\pm\!0.023\!\pm\!0.016$ | 64 | ADAMOVICH | 92 OMEG | π^- 340 GeV |
| $0.108\!\pm\!0.024\!\pm\!0.008$ | 79 | FRABETTI | 92 E687 | γBe |
| 0.102 ± 0.013 | 345 | ⁶³ AMMAR | 91 CLEO | e^+e^-pprox 10.5 GeV |
| $0.096\!\pm\!0.018\!\pm\!0.007$ | 66 | ANJOS | 91 E691 | $\gamma\mathrm{Be}$ 80–240 GeV |
| | | | | |

⁶³AMMAR 91 finds 1.25 ± 0.25 ± 0.25 ρ^0 's per $\pi^+ \pi^+ \pi^- \pi^-$ decay, but can't untangle the resonant substructure ($\rho^0 \rho^0$, $a_1^{\pm} \pi^{\mp}$, $\rho^0 \pi^+ \pi^-$).

| $\Gamma(\pi^+\pi^+\pi^-\pi^-\pi^0)/\Gamma_{total}$ | | | | $\Gamma_{115}/\Gamma_{115}$ |
|--|----------------------|----------|--------------------|-----------------------------|
| VALUE | DOCUMENT ID | TECN | COMMENT | |
| $0.0192 \substack{+0.0041 \\ -0.0038}$ | ⁶⁴ BARLAG | 92c ACCM | π^- Cu 230 GeV | |

⁶⁴ BARLAG 92C computes the branching fraction using topological normalization.

HTTP://PDG.LBL.GOV

 $\Gamma(\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-)/\Gamma_{\text{total}}$ Γ116/Γ 65 BARLAG 0.0004 ± 0.0003 92C ACCM π^- Cu 230 GeV ⁶⁵BARLAG 92C computes the branching fraction using topological normalization. Hadronic modes with a $K\overline{K}$ pair - $\Gamma(K^+K^-)/\Gamma(K^-\pi^+$ Γ_{117}/Γ_{19} TECN COMMENT VALUE EVTS DOCUMENT ID 0.1109±0.0033 OUR FIT 0.1109 ± 0.0033 OUR AVERAGE $0.109 \ \pm 0.003 \ \pm 0.003$ 98C E791 π^- nucleus, 500 3317 AITALA GeV $e^+e^-\approx \Upsilon(4S)$ $0.116 \ \pm 0.007 \ \pm 0.007$ 1102 ASNER 96B CLE2 $\gamma \operatorname{Be} \overline{E}_{\gamma} = 220$ $0.109 \ \pm 0.007 \ \pm 0.009$ FRABETTI 94C E687 581 GeV $0.107 \ \pm 0.029 \ \pm 0.015$ 103 ADAMOVICH 92 OMEG π^- 340 GeV $0.138\ \pm 0.027\ \pm 0.010$ 155 FRABETTI 92 E687 γBe 0.16 ± 0.05 34 ALVAREZ 91b NA14 Photoproduction $0.107 \ \pm 0.010 \ \pm 0.009$ 91D E691 Photoproduction 193 ANJOS $e^+e^- \approx 10 \text{ GeV}$ $0.10 \pm 0.02 \pm 0.01$ 131 ALBRECHT 90C ARG e^+e^- 10.5–11 $0.117 \ \pm 0.010 \ \pm 0.007$ ALEXANDER 90 CLEO 249 GeVBALTRUSAIT...85E MRK3 e^+e^- 3.77 GeV $0.122 \ \pm 0.018 \ \pm 0.012$ 118 79D MRK2 e^+e^- 3.77 GeV $0.113\ \pm 0.030$ ABRAMS $\Gamma(K^+K^-)/\Gamma(\pi^+\pi^-)$ $\Gamma_{117}/\Gamma_{111}$ The unused results here are redundant with $\Gamma(K^+K^-)/\Gamma(K^-\pi^+)$ and $\Gamma(\pi^+\pi^-)/\Gamma(K^-\pi^+)$ measurements by the same experiments. DOCUMENT ID TECN COMMENT VALUE • • • We do not use the following data for averages, fits, limits, etc. • • • $2.75 \!\pm\! 0.15 \!\pm\! 0.16$ AITALA 98C E791 π^- nucleus, 500 GeV $\gamma \operatorname{Be} \overline{E}_{\gamma} =$ 220 GeV $2.53\!\pm\!0.46\!\pm\!0.19$ FRABETTI 94C E687 92 OMEG π^- 340 GeV $2.23\!\pm\!0.81\!\pm\!0.46$ ADAMOVICH $1.95\!\pm\!0.34\!\pm\!0.22$ ANJOS 91D E691 Photoproduction $e^+e^- \approx 10 \text{ GeV}$ 90c ARG 2.5 ± 0.7 ALBRECHT ALEXANDER 90 CLEO e^+e^- 10.5–11 GeV $2.35\!\pm\!0.37\!\pm\!0.28$ $\Gamma(K^{0}\overline{K}^{0})/\Gamma(\overline{K}^{0}\pi^{+}\pi^{-})$ Γ_{118}/Γ_{21} VALUE EVTS DOCUMENT ID TECN COMMENT 0.0120±0.0033 OUR FIT Error includes scale factor of 1.3. 0.0117±0.0033 OUR AVERAGE Error includes scale factor of 1.3. See the ideogram below. 96B CLE2 $e^+e^- \approx \Upsilon(4S)$ $0.0101 \pm 0.0022 \pm 0.0016$ 26 ASNER $\gamma \operatorname{Be} \overline{E}_{\gamma} = 220 \operatorname{GeV}$ $0.039 \pm 0.013 \pm 0.013$ 20 94J E687 FRABETTI $0.021 \begin{array}{c} +0.011 \\ -0.008 \end{array} \pm 0.002$ 5 ALEXANDER 90 CLEO e^+e^- 10.5–11 GeV



| Г(К *(892) ⁰ К ⁰)/Г(К | $(\overline{0}\pi^+\pi^-)$ | | | | | Г ₁₃₉ /Г ₂₁ |
|--|------------------------------|------------------------------|--------------|-------------|-----------------------|-----------------------------------|
| Unseen decay mod | es of the \overline{K} | $(892)^0$ are incl | luded | | | |
| VALUE | <u>CL%</u> | DOCUMENT ID | | TECN | COMMENT | |
| <0.029 | 90 following (| AMMAR | 91 s fits | CLEO | $e^+e^-\approx 1$ | 10.5 GeV |
| <0.03 | 90 | ALBRECHT | 90C | ARG | $e^+e^-\approx 1$ | 10 GeV |
| Г(<i>К</i> *(892) ⁺ <i>К</i> ⁻)/Г(| $K^{-}\pi^{+})$ | | | | | Γ140/Γ19 |
| Unseen decay mod | es of the <i>K</i> | $(892)^+$ are inc | ludeo | d. | COMMENT | - 107 - 10 |
| 0.090±0.020 OUR FIT | | DOCUMENT ID | | TECN | | |
| $0.16 \begin{array}{c} +0.08 \\ -0.06 \end{array}$ | 69 | OLAN SOLAN | 91 | E691 | $\gamma{ m Be}$ 80–24 | 0 GeV |
| ⁶⁹ The factor 100 at the | e top of col | umn 2 of Table I | of A | NJOS 9 | 1 should be | omitted. |
| Г(К*(892)+К-)/Г(| $\overline{K}^0 \pi^+ \pi^-$ |) | | | | Γ_{140}/Γ_{21} |
| Unseen decay mod | es of the <i>K</i> | $(892)^+$ are inc | ludeo | d. | | |
| | <u>EVTS</u> Error inclu | DOCUMENT ID | of 1 | <u>TECN</u> | <u>COMMENT</u> | |
| 0.058+0.014 OUR AVER | | des scale factor | of 1. | 1. | | |
| 0.064 ± 0.018 | 23 | AMMAR | 91 | CLEO | $e^+e^- \approx 1$ | 10.5 GeV |
| $0.05 \pm 0.02 \pm 0.01$ | 15 | ALBRECHT | 90C | ARG | $e^+e^- \approx 1$ | 10 GeV |
| $\Gamma(K^0K^-\pi^+ \text{ nonresor})$ | nant)/Г(<i>Н</i> | $(\pi^{-}\pi^{+})$ | | | | Γ ₁₂₂ /Γ ₁₉ |
| | 7(| DOCUMENT ID | 01 | <u>TECN</u> | COMMENT | 0.0.1/ |
| | | ANJUS | 91 | E091 | γ ве 80−24 | U GeV |
| ⁷⁰ The factor 100 at the | e top of col | umn 2 of Table I | of A | NJOS 9 | 1 should be | omitted. |
| $\Gamma(\overline{K}^{0}K^{+}\pi^{-})/\Gamma(K^{-})$ | $\pi^+)$ | | | | | Γ123/Γ19 |
| VALUE | , | DOCUMENT ID | | TECN | COMMENT | 1207 19 |
| 0.129±0.025 OUR FIT | | | | | | |
| 0.10 ±0.05 | 1. | ^L ANJOS | 91 | E691 | γ Be 80–24 | 0 GeV |
| 71 The factor 100 at the | e top of col | umn 2 of Table I | of A | NJOS 9 | 1 should be | omitted. |
| $\Gamma(\overline{K}^{0}K^{+}\pi^{-})/\Gamma(\overline{K}^{0}\pi^{-})$ | $\pi^{+}\pi^{-}$) | | | | | Г123/Г21 |
| VALUE | EVTS | DOCUMENT ID | | TECN | COMMENT | - 125/ - 21 |
| 0.091±0.018 OUR FIT | | | | | | |
| 0.098 ± 0.020 | 55 | AMMAR | 91 | CLEO | $e^+e^- \approx 1$ | 10.5 GeV |
| $\Gamma(K^*(892)^0\overline{K}^0)/\Gamma(K)$ | $(-\pi^+)$ | | | | | Γ141 /Γ10 |
| Unseen decav mod | es of the <i>K</i> | *(892) ⁰ are incl | luded | | | |
| VALUE | | DOCUMENT ID | | TECN | <u>COMMENT</u> | |
| $\bullet \bullet \bullet$ We do not use the | following o | lata for averages | s, fits | , limits, | etc. • • • | |
| $0.00 \substack{+0.04 \\ -0.00}$ | 72 | ² ANJOS | 91 | E691 | γBe 80–24 | 0 GeV |
| 70 | <i>.</i> | | <u>ـ ۲</u> ۸ | | 1 chould be | amittad |

| Г(<i>К</i> *(892) ⁰ <i>К</i> ⁰)/Г | $(\overline{K}^0\pi^+\pi^-)$ | -) | | | | Γ_{141}/Γ_{21} |
|---|--|-----------------------------|-------------|-------------|---------------------------------|-----------------------------------|
| Unseen decay m | odes of the | $K^*(892)^0$ are inc | luded | | COMMENT | |
| <u>VALUE</u> | <u> </u> | <u>DOCUMENT ID</u> AMMAR | 01 | | $e^+e^- \approx$ | 10.5 GeV |
| 0.015 | 50 | | 91 | CLLO | $e e \sim$ | 10.5 Gev |
| $\Gamma(K^*(892)^-K^+)/$ | $\Gamma(K^-\pi^+)$ |) | | | | Γ ₁₄₂ /Γ ₁₉ |
| Unseen decay m | odes of the | $K^*(892)^-$ are in | cludec | l. | 601 / JENT | |
| VALUE | the followin | <u>DOCUMENTID</u> | c fite | <u>IECN</u> | <u>COMMENT</u> | |
| | | | 5, 1115 | , mmus, | | |
| 0.00 + 0.03 - 0.00 | | ⁷³ ANJOS | 91 | E691 | γ Be 80–24 | 40 GeV |
| ⁷³ The factor 100 at | the top of o | column 2 of Table | I of A | NJOS 9 | 1 should be | omitted. |
| Γ(<i>K</i> *(892) ⁻ <i>K</i> ⁺)/ | Г(К⁰ π ⁺ 1 | π ⁻) | | | | Γ142/Γ21 |
| Unseen decay m | odes of the | K*(892) ⁻ are in | cludec | Ι. | | , |
| VALUE | EVTS | DOCUMENT ID | | TECN | COMMENT | |
| 0.034 ± 0.019 | 12 | AMMAR | 91 | CLEO | $e^+e^- \approx$ | 10.5 GeV |
| $\Gamma(\overline{K}^0K^+\pi^-$ nonreg | sonant)/F | $(K^{-}\pi^{+})$ | | | | F126 / F10 |
| VALUE | | DOCUMENT ID | | TECN | <u>COMMENT</u> | • 120/ • 19 |
| $0.10^{+0.06}_{-0.05}$ | | ⁷⁴ ANJOS | 91 | E691 | γ Be 80–24 | 40 GeV |
| ⁷⁴ The factor 100 at | the top of (| column 2 of Table | l of A | | 1 should be | omitted |
| | | | 1 01 71 | 11505 5 | | _ /_ |
| $\Gamma(K^+K^-\pi^0)/\Gamma(K)$ | $(-\pi^+\pi^0)$ | | | | | Г ₁₂₇ /Г ₂₉ |
| VALUE | <u>EVTS</u> | DOCUMENT ID | 060 | <u>TECN</u> | $\frac{COMMENT}{2}$ | $\Upsilon(AE)$ |
| 0.0095±0.0020 | 151 | ASNER | 90 B | CLE2 | e'e ≈ | 1 (45) |
| $\Gamma(K_S^0 K_S^0 \pi^0) / \Gamma_{\text{total}}$ | al | | | | | Г ₁₂₈ /Г |
| VALUE | | DOCUMENT ID | | TECN | COMMENT | |
| <0.00059 | | ASNER | 96 B | CLE2 | $e^+e^- \approx$ | $\Upsilon(4S)$ |
| $\Gamma(\phi\pi^0)/\Gamma_{\rm table}$ | | | | | | Γ142/Γ |
| VALUE | <u>CL%</u> | DOCUMENT ID | | TECN | <u>COMMENT</u> | - 145/ - |
| <0.0014 | 90 | ALBRECHT | 941 | ARG | $e^+e^- \approx 1$ | 0 GeV |
| | | | | | | F /F |
| $ (\phi\eta)/ _{\text{total}}$ | | | | TECN | COMMENT | ₁₄₄ / |
| <u>VALUE</u> | <u> </u> | | 0/1 | ARG | $\frac{COMMENT}{a^+a^-} \sim 1$ | 0.601 |
| | 90 | ALDINECTT | 941 | | e e ≈1 | |
| $\Gamma(\phi\omega)/\Gamma_{	ext{total}}$ | | | | | | Г ₁₄₅ /Г |
| VALUE | <u>CL%</u> | DOCUMENT ID | | TECN | COMMENT | |
| <0.0021 | 90 | ALBRECHT | 941 | ARG | $e^+e^-\approx 1$ | 0 GeV |
| | | | | | | |

| | $(\pi^{+}\pi^{-})$ | | | | Г ₁₂₉ /Г ₃₇ |
|--|---------------------|--|-------------------------|--|--|
| | <u>EVTS</u> | DOCUMENT | ID | TECN | COMMENT |
| 0.0334 ± 0.0028 OUR AVERAGI | 126 | | 000 | E701 | E00 |
| $0.0313 \pm 0.0037 \pm 0.0036$ | 130 | AITALA | 98 D | E/91 | π nucleus, 500 GeV |
| $0.035 \pm 0.004 \pm 0.002$ | 244 | FRABETTI | 95 C | E687 | $\gamma \operatorname{Be}, \overline{E}_{\gamma} \approx 200$ GeV |
| $0.041 \pm 0.007 \pm 0.005$ | 114 | ALBRECHT | 941 | ARG | $e^+e^- \approx 10 \text{ GeV}$ |
| 0.0314 ± 0.010 | 89 | AMMAR | 91 | CLEO | e^+e^-pprox 10.5 GeV |
| $0.028 \begin{array}{c} +0.008 \\ -0.007 \end{array}$ | | ANJOS | 91 | E691 | $\gamma \operatorname{Be}$ 80–240 GeV |
| $\Gamma(\phi \pi^+ \pi^-) / \Gamma(K^- \pi^+ \pi^+ \pi)$ | r [—]) | cluded | | | Г ₁₄₆ /Г ₃₇ |
| VALUE | <u>DOCL</u> | IMENT ID | TECN | СОММЕ | INT |
| 0.014 ± 0.004 OUR AVERAGE | E Error ir belov | ncludes scale fa | ctor of 1 | .5. See | the ideogram |
| 0.011 ± 0.003 | FRA | BETTI 95c | E687 | γ Be, \overline{E} | $T_{\gamma} pprox 200 { m GeV}$ |
| $0.020 \pm 0.006 \pm 0.005 28$ | ALB | RECHT 94i | ARG | e^+e^- | pprox 10 GeV |
| 0.024 ±0.006 34 | ⁷⁵ AMN | /IAR 91 | CLEO | e^+e^- | pprox 10.5 GeV |
| • • We do not use the follow | ing data fo | or averages, fits | , limits, | etc. • • | • |
| 0.0076 + 0.0066 - 0.0049 3 | ANJ | OS 91 | E691 | $\gamma{\sf Be}$ 80 |)–240 GeV |
| WEIGHTED AVERAGE 0.014±0.004 (Error scaled b | y 1.5) | FRABETTI 95 ALBRECHT 94 AMMAR 91 (Confide | C E687 I ARG CLEO | $\frac{\chi^2}{\frac{1.2}{0.5}}_{\frac{2.6}{4.4}}_{\frac{4.4}{2.6}}$ | |
| 0 0.01 0.02 0.03 | | | | | |

HTTP://PDG.LBL.GOV Page 35 Created: 6/29/1998 12:22



| <0.017 | | | | |
|---|--|--|---|--|
| <0.017 | 90 | ⁷⁶ FRABETTI | 95C E687 | $\gamma{ m Be}$, $\overline{E}_{\gamma}pprox$ 200 GeV |
| $0.010 \substack{+0.016 \\ -0.010}$ | | ANJOS | 91 E691 | γ Be 80–240 GeV |
| ⁷⁶ These upper lin | nits are in cor | flict with values ir | ı the next twc | o data blocks. |
| L(K*(803)0 K- | π+)/Γ/ <i>Κ</i> - | <i>π</i> + <i>π</i> + <i>π</i> −) | | Γ /Γ |
| The $K^{*0}K^{-1}$ | π^+ and \overline{K}^{*0} | $K^+\pi^-$ modes are | e distinguishe | 150/ 37 d by the charge of the pior |
| in $D^*(2010)^3$ | $\pm \rightarrow D^0 \pi^{\pm}$ | decays. Unseen de | cay modes of | the $K^*(892)^0$ are included |
| VALUE | EVTS | DOCUMENT ID | TECN | COMMENT |
| • • • We do not u | se the followi | ng data for average | es, fits, limits, | etc. • • • |
| $0.043 \pm 0.014 \pm 0.00$ |)9 55 | 11 ALBRECHT | 941 ARG | e^+e^-pprox 10 GeV |
| ¹¹ This ALBRECH | IT 941 value is | s in conflict with u | pper limits giv | ven above. |
| Γ(K *(892) ⁰ K ⁺ | $\pi^{-})/\Gamma(K^{-}$ | $\pi^+\pi^+\pi^-)$ | | Г ₁₅₁ /Г ₃₇ |
| The <i>K</i> * ⁰ <i>K</i> ⁻ | π^+ and \overline{K}^{*0} | $K^+\pi^-$ modes are | e distinguishe | d by the charge of the pior |
| in <i>D</i> *(2010) ⁼ | $^{\pm} \rightarrow D^{0} \pi^{\pm}$ | decays. Unseen de | cay modes of | the $\overline{K}^*(892)^{U}$ are included |
| • • • We do not u | <u>EV15</u> se the followi | ng data for average | es fits limits | |
| $0.023 \pm 0.013 \pm 0.00$ | | | 0/1 ARC | $e^+e^- \approx 10 \text{ GeV}$ |
| 78 This ALBRECH | J OAL value i | ALDICECTT | nner limits di | $e^{-}e^{-} \approx 10 \text{ GeV}$ |
| | | | pper mints gr | |
| Г(<i>K</i> *(892) ⁰ <i>K</i> *(| <mark>.</mark> 892)⁰)/Г(<i>ŀ</i> | $(-\pi^+\pi^+\pi^-)$ | 0 | Γ ₁₅₂ /Γ ₃₇ |
| Unseen decay | y modes of th | e <i>K</i> *(892) ⁰ and <i>k</i> | (*(892) ⁰ are i | included. |
| <u>0.018±0.007 OU</u> | <u>JR AVERAGE</u> | Error includes so | | 1.2. |
| 0.016 ± 0.006 | | FRABETTI | 95C E687 | $\gamma{ m Be},\ \overline{E}_\gammapprox$ 200 GeV |
| 0.036 + 0.020 | 11 | ANJOS | 91 E691 | γ Be 80–240 GeV |
| ● ● ● We do not u | se the followi | ng data for average | es. fits. limits. | . etc. ● ● ● |
| | 90 | AITALA | 98D E791 | π^- nucleus. 500 GeV |
| < 0.02 | | | | |
| <0.02 <0.033 | 90 | ⁷⁹ AMMAR | 91 CLEO | e^+e^-pprox 10.5 GeV |
| <0.02 <0.033 ⁷⁹ A corrected val | 90 ue (G. Monet | ⁷⁹ AMMAR i, private communi | 91 CLEO | $e^+e^-pprox 10.5~{ m GeV}$ |
| <0.02 <0.033 ⁷⁹ A corrected val $\Gamma(K^{+}K^{-}\pi^{+}\pi^{-}$ | 90 ue (G. Monet · non-<i>ф</i>)/Г. | ⁷⁹ AMMAR i, private communi | 91 CLEO ication). | e ⁺ e ⁻ ≈ 10.5 GeV Γιαε /Γ |
| <0.02 <0.033 ⁷⁹ A corrected val F(K⁺K⁻ π⁺ π⁻ VALUE | 90 ue (G. Monet ⁻ non-<i>ф</i>)/Г_{tr} | ⁷⁹ AMMAR i, private communi otal DOCUMENT ID | 91 CLEO ication). TECN | $e^+e^-pprox 10.5$ GeV $\Gamma_{135}/\Gamma_{COMMENT}$ |
| <0.02 <0.033 ⁷⁹ A corrected val $\Gamma(K^+K^-\pi^+\pi^-)$ VALUE ••• We do not u | 90 ue (G. Monet non-<i>φ</i>)/Γ_{tr} se the following | ⁷⁹ AMMAR i, private communi otal <u>DOCUMENT ID</u> ng data for average | 91 CLEO ication). <u>TECN</u> es, fits, limits, | $e^+e^- \approx 10.5 \text{ GeV}$ $\Gamma_{135}/\Gamma_{135}$ |
| <0.02 <0.033 ⁷⁹ A corrected val $\Gamma(K^+K^-\pi^+\pi^-$ <u>VALUE</u> ••• We do not u 0.0017±0.0005 | 90 ue (G. Monet non-ϕ)/Γ_{tr} se the following | ⁷⁹ AMMAR i, private communi otal <u>DOCUMENT ID</u> ng data for average ⁸⁰ BARLAG | 91 CLEO ication). <u>TECN</u> es, fits, limits, 92C ACCM | $e^+e^- \approx 10.5 \text{ GeV}$ Γ_{135}/Γ_{1 |
| <0.02 <0.033 ⁷⁹ A corrected val $\Gamma(K^+K^-\pi^+\pi^-$ <u>VALUE</u> ••• We do not u 0.0017±0.0005 ⁸⁰ BARLAG 92C c | 90 ue (G. Monet non- $\phi)/\Gamma_t$ se the following computes the | ⁷⁹ AMMAR i, private communi otal <u>DOCUMENT ID</u> ng data for average ⁸⁰ BARLAG branching fraction | 91 CLEO ication). <u>TECN</u> es, fits, limits, 92C ACCM using topolog | $e^+e^- \approx 10.5 \text{ GeV}$ Γ_{135}/Γ $\frac{COMMENT}{\pi^- \text{Cu } 230 \text{ GeV}}$ gical normalization. |
| <0.02 <0.033 79 A corrected val $\Gamma(K^+K^-\pi^+\pi^-$ <u>VALUE</u> ••• We do not u 0.0017±0.0005 80 BARLAG 92C c | 90 ue (G. Monet non-ϕ)/Γ_{tr} se the following computes the | ⁷⁹ AMMAR i, private communi otal <u>DOCUMENT ID</u> ng data for average ⁸⁰ BARLAG branching fraction | 91 CLEO ication). <u>TECN</u> es, fits, limits, 92C ACCM using topolog | $e^+e^- \approx 10.5 \text{ GeV}$ Γ_{135}/Γ $etc. \bullet \bullet \bullet$ π^- Cu 230 GeV gical normalization. Γ_{135}/Γ |
| <0.02 <0.033 ⁷⁹ A corrected val $\Gamma(K^+K^-\pi^+\pi^-$ <u>VALUE</u> ••• We do not u 0.0017±0.0005 ⁸⁰ BARLAG 92C c $\Gamma(K^+K^-\pi^+\pi^-$ | 90 ue (G. Monet non-ϕ)/Γ_{tr} se the following computes the nonresonar | ⁷⁹ AMMAR i, private communi otal <u>DOCUMENT ID</u> ng data for average ⁸⁰ BARLAG branching fraction ht)/ $\Gamma(K^-\pi^+\pi^+)$ | 91 CLEO ication). \underline{TECN} es, fits, limits, 92C ACCM using topolog π^{-} | $e^+e^- \approx 10.5 \text{ GeV}$ Γ_{135}/Γ $e^{COMMENT}$ π^- Cu 230 GeV fical normalization. Γ_{136}/Γ_{37} |
| <0.02 <0.033 79 A corrected val $\Gamma(K^+K^-\pi^+\pi^-$ <u>VALUE</u> ••• We do not u 0.0017±0.0005 80 BARLAG 92C c $\Gamma(K^+K^-\pi^+\pi^-$ <u>VALUE</u> <0.011 | 90 ue (G. Monet non- ϕ)/ Γ_{tr} se the following computes the nonresonar <u>CL%</u> 90 | ⁷⁹ AMMAR i, private communi btal <u>DOCUMENT ID</u> ng data for average ⁸⁰ BARLAG branching fraction bt)/$\Gamma(K^-\pi^+\pi^+)$ <u>DOCUMENT ID</u> FRABETTI | 91 CLEO ication). \underline{TECN} es, fits, limits, 92C ACCM using topolog π^{-}) \underline{TECN} 95C F687 | $e^+e^- \approx 10.5 \text{ GeV}$ Γ_{135}/Γ $etc. \bullet \bullet \bullet$ π^- Cu 230 GeV fical normalization. Γ_{136}/Γ_{37} $\frac{COMMENT}{\gamma \text{ Be, } \overline{E}_{2.1} \approx 200 \text{ GeV}}$ |
| <0.02 <0.033 79 A corrected val $\Gamma(K^+K^-\pi^+\pi^-$ <u>VALUE</u> ••• We do not u 0.0017±0.0005 80 BARLAG 92C c $\Gamma(K^+K^-\pi^+\pi^-$ <u>VALUE</u> <0.011 ••• We do not u | 90 ue (G. Monet non-ϕ)/Γ_{tr} se the following computes the nonresonar <u>CL%</u> 90 se the following | ¹⁹ AMMAR i, private communi btal <u>DOCUMENT ID</u> ng data for average ⁸⁰ BARLAG branching fraction bt)/ $\Gamma(K^-\pi^+\pi^+)$ <u>DOCUMENT ID</u> FRABETTI ng data for average | 91 CLEO ication). \underline{TECN} es, fits, limits, 92C ACCM using topolog (π^{-}) \underline{TECN} 95C E687 es, fits, limits. | $e^+e^- \approx 10.5 \text{ GeV}$ Γ_{135}/Γ etc. ••• π^- Cu 230 GeV fical normalization. Γ_{136}/Γ_{37} $\frac{COMMENT}{\gamma \text{ Be, } \overline{E}_{\gamma} \approx 200 \text{ GeV}}$ etc. ••• |
| <0.02 <0.033 79 A corrected val $\Gamma(K^+K^-\pi^+\pi^-)^{VALUE}$ ••• We do not u 0.0017±0.0005 80 BARLAG 92C c $\Gamma(K^+K^-\pi^+\pi^-)^{VALUE}$ <0.011 ••• We do not u | 90 ue (G. Monet non- ϕ)/ Γ_{tr} se the following computes the nonresonar <u>90</u> se the following se the following | ¹⁹ AMMAR i, private communi btal <u>DOCUMENT ID</u> ng data for average ⁸⁰ BARLAG branching fraction bt)/ $\Gamma(K^-\pi^+\pi^+)$ <u>DOCUMENT ID</u> FRABETTI ng data for average | 91 CLEO ication). \underline{TECN} es, fits, limits, 92C ACCM using topolog π^{-}) \underline{TECN} 95C E687 es, fits, limits, 01 ECO | $e^+e^- \approx 10.5 \text{ GeV}$ Γ_{135}/Γ $etc. \bullet \bullet$ π^- Cu 230 GeV Γ_{136}/Γ_{37} Γ_{136}/Γ_{37} $\frac{COMMENT}{\gamma \text{ Be, } \overline{E}_{\gamma} \approx 200 \text{ GeV}}$ $etc. \bullet \bullet$ |
| <0.02 <0.033 79 A corrected val $\Gamma(K^+K^-\pi^+\pi^-$ <u>VALUE</u> ••• We do not u 0.0017±0.0005 80 BARLAG 92C cc $\Gamma(K^+K^-\pi^+\pi^-$ <u>VALUE</u> <0.011 ••• We do not u 0.001+0.011 -0.001 | 90 ue (G. Monet non-ϕ)/Γ_{tx} se the following computes the nonresonar <u>CL%</u> 90 se the following | ¹⁹ AMMAR i, private communi btal <u>DOCUMENT ID</u> ng data for average ⁸⁰ BARLAG branching fraction bt)/ $\Gamma(K^-\pi^+\pi^+)$ <u>DOCUMENT ID</u> FRABETTI ng data for average ANJOS | 91 CLEO ication). \underline{TECN} es, fits, limits, 92C ACCM using topolog π^{-}) \underline{TECN} 95C E687 es, fits, limits, 91 E691 | $e^+e^- \approx 10.5 \text{ GeV}$ Γ_{135}/Γ etc. ••• π^- Cu 230 GeV fical normalization. Γ_{136}/Γ_{37} $\frac{COMMENT}{\gamma \text{ Be, } \overline{E}_{\gamma} \approx 200 \text{ GeV}}$ etc. ••• $\gamma \text{ Be 80-240 GeV}$ |
| <0.02 <0.033 79 A corrected val $\Gamma(K^+K^-\pi^+\pi^-)^{VALUE}$ ••• We do not u 0.0017±0.0005 80 BARLAG 92C c $\Gamma(K^+K^-\pi^+\pi^-)^{VALUE}$ <0.011 ••• We do not u 0.001 $^{+0.011}_{-0.001}$ $\Gamma(K^0\overline{K}^0\pi^+\pi^-)^{-1})$ | 90 ue (G. Monet non-ϕ)/Γ_{tr} se the following computes the nonresonar <u>CL%</u> 90 se the following $\Delta /\Gamma(\overline{K}^0 \pi^+ \eta)$ | ¹⁹ AMMAR i, private communi btal <u>DOCUMENT ID</u> ng data for average ⁸⁰ BARLAG branching fraction bt)/ $\Gamma(K^-\pi^+\pi^+$ <u>DOCUMENT ID</u> FRABETTI ng data for average ANJOS T -) | 91 CLEO ication). <u>TECN</u> es, fits, limits, 92C ACCM using topolog +π−) <u>TECN</u> 95C E687 es, fits, limits, 91 E691 | $e^+e^- \approx 10.5 \text{ GeV}$ Γ_{135}/Γ $etc. \bullet \bullet \bullet$ π^- Cu 230 GeV fical normalization. Γ_{136}/Γ_{37} $\frac{COMMENT}{\gamma \text{ Be, } \overline{E}_{\gamma} \approx 200 \text{ GeV}}$ ϕ etc. • • • $\gamma \text{ Be 80-240 GeV}$ |
| <0.02 <0.033 79 A corrected val $\Gamma(K^+K^-\pi^+\pi^-$ <u>VALUE</u> ••• We do not u 0.0017±0.0005 80 BARLAG 92C cc $\Gamma(K^+K^-\pi^+\pi^-)$ <u>VALUE</u> <0.011 ••• We do not u 0.001 $^{+0.011}_{-0.001}$ $\Gamma(K^0\overline{K}^0\pi^+\pi^-)$ VALUE | 90 ue (G. Monet non-ϕ)/Γ_{tr} se the following computes the nonresonar <u>CL%</u> 90 se the following se the following $(\Gamma(\overline{K}^0 \pi^+ \eta))$ | ¹⁹ AMMAR i, private communi btal <u>DOCUMENT ID</u> ng data for average ⁸⁰ BARLAG branching fraction ht)/ $\Gamma(K^-\pi^+\pi^+)$ <u>DOCUMENT ID</u> FRABETTI ng data for average ANJOS t ^-) EVTS DOCUM. | 91 CLEO ication). \underline{TECN} es, fits, limits, 92C ACCM using topolog π^{-}) \underline{TECN} 95C E687 es, fits, limits, 91 E691 ENT ID | $e^+e^- \approx 10.5 \text{ GeV}$ Γ_{135}/Γ etc. ••• π^- Cu 230 GeV fical normalization. Γ_{136}/Γ_{37} $\frac{COMMENT}{\gamma \text{ Be, } \overline{E}_{\gamma} \approx 200 \text{ GeV}}$ etc. ••• $\gamma \text{ Be 80-240 GeV}$ Γ_{137}/Γ_{21} TECN COMMENT |

| | | D00 | UNAENT IN | | TECN | CONANAEN | 17 |
|---|---|---|---|--|--|--|--|
| 0031+00020 | | 81 _{BAE} | <u>UMENTID</u> REAG | 920 | ACCM | $\frac{COMMEN}{\pi^{-}}$ Cu ⁴ | 230 GeV |
| ⁸¹ BARLAG 92C comp | outes the | branching | g fraction | using t | opologia | al norma | alization. |
| | I | Rare or f | orbidder | n mod | es — | | |
| - (<i>V</i> +)== (|)/r/ <i>v</i> = | - <i>o</i> +) | | | | | г /г |
| $(\mathbf{n} \cdot \boldsymbol{\ell} \boldsymbol{\nu}_{\boldsymbol{\ell}} (\text{via } D^{\circ})$ |)/! (^ | $\ell' \nu_{\ell}$ | | | c | | 153/17 |
| This is a $D^{\circ}-D^{\circ}$ suppressed decay | mixing I s that oc | limit witho cur when | out the co using had | mplica Ironic r | tions of nodes - F | possible for the li | doubly-Cabibbo- imits on $m = 0$ |
| | г | / F +ba | t como fr | om th | bost n | oiving lir | mit see poor the |
| $D_2^{0 } = D_1^{0 } D_1^{0 }$ | $^{-1}D_{2}^{0 }$ | D^0 D^0 | t come m | | e Dest II | nxing in | fint, see fiear the |
| beginning of thes | D^0 Lis | stings. | | | TECN | CO141451 | |
| <u> </u> | <u> </u> | 82 AIT | <u>UMENTID</u> | 060 | <u>TECN</u> | | |
| < U.UU5 | 90 | | ALA | 90C | E/91 | π nucl | ieus, 500 Gev |
| ^{o2} AITALA 96C uses <i>L</i> | $)^{*+} \rightarrow$ | $D^{0}\pi^{+}$ (a | nd charge | conjug | ;ate) de | cays to io | dentify the charm |
| at production and <i>L</i> at decay. | $D^0 \rightarrow K$ | $-\ell^+\nu_\ell$ (a | and charge | e conju | gate) de | cays to i | dentify the charm |
| $-(K+\pi-\alpha K+\pi-)$ | -+ | (via <u>77</u> 0)) | /r(<i>k</i> -/ | #+~r | K−_+ | <i></i> |) [/[. |
| $(\mathbf{\Lambda} \times \mathbf{\Lambda} \circ \mathbf{\Lambda} \circ$ | | | | | | |) י154/י0 ה ה געה |
| I his is a $D^{\circ}-D^{\circ}$ | mixing lii | mit. For ti | ne limits o | on ∣ <i>m</i> _ | n — m _ | ∠ and ∪ | |
| | 0 | | | D | $D_1 D$ | 2 | $D_1^0 - D_2^0 D_2^0 D_2^0$ |
| that come from t | he best i | mixing lim | iit, see nea | ar the l | oeginnin | g of the | $D_1^0 - D_2^0 D_2^0 D_2^0$ se D^0 Listings. |
| that come from t /ALUE | he best <u>CL%</u> | mixing lim <u>DOC</u> | iit, see nea UMENT ID | ar the l | oeginnin TECN | g of thes <i>COMMEN</i> | $D_1^0 - D_2^0 / D_0^0$ se D^0 Listings. |
| that come from t /ALUE <0.0085 | he best <u>CL%</u> 90 | mixing lim <u>DOC</u> 83 AIT | iit, see nea <i>UMENT ID</i> ALA | ar the l | oeginnin <u>TECN</u> E791 | π^{-} nucl | $D_1^0 - D_2^0 / D_0^0$ se D^0 Listings. $\frac{17}{1}$ leus, 500 GeV |
| that come from t / <u>ALUE</u> <0.0085 ⁸³ AITALA 98 uses dec | he best i <u>CL%</u> 90 cay-time | mixing lim <u>DOC</u> ⁸³ AIT/ informatic | nit, see nea <u>UMENT ID</u> ALA on to distir | ar the l 98 nguish c | oeginnin TECN E791 doubly C | π^{-} nucl abibbo-s | D ₁ ⁰ D ₂ ⁰ D ₂ ⁰ Se D ⁰ Listings. <u>T</u> leus, 500 GeV suppressed decays |
| that come from t <u>ALUE</u> <0.0085 ⁸³ AITALA 98 uses dec from $D^0 - \overline{D}^0$ mixing | he best <u>CL%</u> 90 cay-time g. The f | mixing lim <u>DOC</u> ⁸³ AIT, informatic it allows i | nit, see nea <u>UMENT ID</u> ALA on to distir nterferenc | ar the l 98 nguish o e betw | oeginnin <u>TECN</u> E791 Joubly C | π^{-} nucl abibbo-s | $D_1^0 - D_2^0 = D_2^0$ se D^0 Listings. D_1^T leus, 500 GeV suppressed decays plitudes, and also |
| that come from t <u>ALUE</u> <0.0085 ⁸³ AITALA 98 uses dec from $D^0 - \overline{D}^0$ mixing allows <i>CP</i> violation | he best r <u>CL%</u> 90 cay-time g. The f in this te | mixing lim <u>DOC</u> ⁸³ AIT, informatic it allows i erm. The o | it, see nea <u>UMENT ID</u> ALA on to distir nterferenc central val | 98 nguish o ue obta | oeginnin <u>TECN</u> E791 doubly C een the | $\frac{0}{2}$ of these g of these $\frac{COMMEN}{\pi}$ nucles abibbo-se two amp 0.0039 $\frac{+}{2}$ | $D_1^0 - D_2^0 / D_0^0$ se D^0 Listings. <u>T</u> leus, 500 GeV suppressed decays plitudes, and also 0.0036 ± 0.0016 |
| that come from t <u>ALUE</u> <0.0085 ⁸³ AITALA 98 uses dec from $D^0 - \overline{D}^0$ mixing allows <i>CP</i> violation When interference i | he best in <u>CL%</u> 90 cay-time g. The f in this te is disallow | mixing lim <u>DOC</u> ⁸³ AIT, informatic it allows i erm. The o wed, the r | iit, see nea <u>UMENT ID</u> ALA on to distir nterferenc central val esult beco | 98 nguish o ue betw ue obta | peginnin <u>TECN</u> E791 doubly C een the nined is (0021 ± | π^{-} nucl abibbo-s two amp 0.0039 \pm 0.0009 \pm | $\begin{array}{c c} D_1^0 & D_2^0 \\ \hline D_1^0 & D_2^0 \\ \hline D_2^0 & D_2^0 \\ \hline D_2$ |
| that come from the top that come from the top top the top top the top | he best i <u>CL%</u> 90 cay-time g. The f in this te s disallov | mixing lim <u>DOC</u> ⁸³ AIT, informatic it allows i erm. The o wed, the ro | it, see nea <u>UMENT ID</u> ALA nto distir nterferenc central val esult beco | ar the l 98 nguish o e betw ue obta omes 0. | peginnin <u>TECN</u> E791 doubly C een the nined is 0 0021 ± | π^{-} nucl abibbo-s two amp 0.0039 \pm | $\frac{D_{1}^{0}}{D_{2}^{0}} + \frac{D_{2}^{0}}{D_{2}^{0}} + \frac{D_{2}^{0}}{D_{2}^{0}}$ se D^{0} Listings. $\frac{D}{D_{1}}$ leus, 500 GeV suppressed decays plitudes, and also 0.0036 ± 0.0016 ± 0.0002 . Γ_{155}/Γ_{19} |
| that come from the term of te | the best in $\frac{CL\%}{90}$ cay-time g. The f in this te disallow π^- mod | mixing lim <u>DOC</u> 83 AIT, informatic it allows i erm. The o wed, the r e is doubl | iit, see nea <u>UMENT ID</u> ALA on to distir nterferenc central val esult becc y Cabibbc | ar the l 98 nguish o e betw ue obta omes 0. | $\sum_{i=1}^{N} D_{i}$ Deginnin TECN E791 doubly C een the nined is 0 0021 \pm essed. | π^{-} nucl abibbo-s two amp 0.0039 \pm 0.0009 \pm | $\frac{D_0^0 - D_0^0}{D_0^0} \frac{D_0^0}{D_0^0}$ se D^0 Listings. IT leus, 500 GeV suppressed decays plitudes, and also 0.0032 ± 0.0016 ± 0.0002 . Γ_{155}/Γ_{19} |
| that come from the two provides that come from the two provides that the two provides the | the best r_{2} $\frac{CL\%}{90}$ cay-time g. The f in this te is disallow $\pi^{-} \mod \pi^{-}$ | mixing lim <u>DOC</u> ⁸³ AIT, informatic it allows i erm. The o wed, the ro e is doubl | it, see nea UMENT ID ALA on to distir nterferenc central val esult beco y Cabibbo <u>DOCU</u> | 98 nguish o e betw ue obta omes 0. <u>JMENT</u> | $rac{1}{2}$ Deginnin TECN E791 doubly C een the nined is 0 0021 \pm essed. | $\frac{0}{2}$ of thes g of thes $\frac{COMMEN}{\pi}$ nucl abibbo-s two amp $0.0039^+_{0.0009}$ = $\frac{TECN}{2}$ | $\frac{D_{1}^{0} - D_{2}^{0}}{D_{2}^{0}} D_{0}^{0}$ se D^{0} Listings. $\frac{D}{D}$ leus, 500 GeV suppressed decays plitudes, and also 0.0036 ± 0.0016 ± 0.0002 . Γ_{155}/Γ_{19} <u>COMMENT</u> |
| that come from the twill | the best of $\frac{CL\%}{90}$ cay-time g. The f in this te s disallow $+$ $\frac{CL\%}{\pi}$ mod $\frac{CL\%}{8}$ | mixing lim <u>DOC</u> 83 AIT, informatic it allows i erm. The o wed, the r e is doubl <u>6 EVTS</u> IGE | it, see nea <u>UMENT ID</u> ALA on to distir nterference central val esult beco y Cabibboc <u>DOCU</u> | 98 nguish o e betw ue obta omes 0. | peginnin <u>TECN</u> E791 doubly C een the nined is (0021 ± essed. | π^{-} nucl abibbo-s two amp 0.0039 $^+_{-}$ 0.0009 = | $\frac{D_{1}^{0} - D_{2}^{0}}{D_{2}^{0}} D_{0}^{0}$ se D^{0} Listings. <i>IT</i> leus, 500 GeV suppressed decays plitudes, and also 0.0036 \pm 0.0016 \pm 0.0002. F155/F19 <u>COMMENT</u> |
| that come from the twist of | the best in $\frac{CL\%}{90}$ cay-time g. The f in this te is disallow π^{-} mod π^{-} mod $CL\%$ AVERA 0007 | mixing lim <u>DOC</u> 83 AIT, informatic it allows i erm. The o wed, the r wed, the r e is doubl <u>6 EVTS</u> GE | iit, see nea <u>UMENT ID</u> ALA on to distir nterferenc central val esult beco y Cabibbo <u>DOCU</u> 84 AITA | ar the l 98 nguish o ve betw ue obta omes 0. o suppro JMENT | $p_1 D D D D D D D D D D D D D D D D D D D$ | $\frac{0}{2}$ and $\frac{1}{2}$ g of thes $\frac{COMMEN}{\pi}$ nucl abibbo-s two amp $0.0039 \stackrel{+}{=}$ 0.0009 = \underline{TECN} E791 | $\frac{D_{1}^{0} - D_{2}^{0}}{D_{2}^{0}} D_{0}^{0}$ se D^{0} Listings. $\frac{D}{D_{1}^{0}} D_{2}^{0}$ Listings. $\frac{D}{D_{1}^{0}} D_{2}^{0}$ leus, 500 GeV suppressed decays plitudes, and also 0.0036 ± 0.0016. ± 0.0002. F155/F19 $\frac{COMMENT}{T}$ |
| that come from the term of term of the term of te | the best of $\frac{CL\%}{90}$ cay-time g. The f in this te s disallow π^{-} mod $\frac{CL\%}{8}$ AVERA | mixing lim <u>DOC</u> 83 AIT, informatic it allows i erm. The o wed, the r e is doubl <u>6 EVTS</u> GE | it, see nea <u>UMENT ID</u> ALA on to distir nterference central val esult beco y Cabibbo <u>DOCC</u> ⁸⁴ AITA ⁸⁵ CINA | ar the I 98 nguish o e betw ue obta omes 0. o suppro <u>JMENT</u> | 21 D Deginnin <u>TECN</u> E791 doubly C een the nined is (0021 ± essed. <u>D</u> 98 94 | $rac{0}{2}$ g of thes $ ac{2}{2}$ g of thes $ ac{COMMEN}{\pi^{-}}$ nucl abibbo-s two amp $ ac{1}{2}$ $ ac{1}{2}$ a | $\frac{D_{1}^{0} - D_{2}^{0}}{P_{2}^{0}} D_{0}^{0}$ se D^{0} Listings. $\frac{D}{D}$ leus, 500 GeV suppressed decays politudes, and also 0.0036 ± 0.0016 ± 0.0002 . F155/F19 $\frac{COMMENT}{\pi^{-}}$ nucleus, 500 GeV $e^{+}e^{-} \approx$ |
| that come from the term of te | the best in $\frac{CL\%}{90}$ cay-time g. The f in this te is disallow π^{-} mod $\frac{CL\%}{2}$ AVERA | mixing lim <u>DOC</u> 83 AIT, informatic it allows i erm. The o wed, the re- e is doubl <u>6 EVTS</u> GE 19 | it, see nea <u>UMENT ID</u> ALA on to distir nterferenc central val esult beco y Cabibbo <u>DOCU</u> 84 AITA 85 CINA | ar the I 98 nguish o e betw ue obta omes 0. o suppro <u>JMENT</u> | peginnin <u>TECN</u> E791 doubly C een the nined is 0 0021 ± essed. D 98 94 | $rac{0}{2}$ g of thes g of thes \underline{COMMEN} π^{-} nucl abibbo-s two amp 0.0039^+_{-} 0.0009^{-} 0.0009^{-} \underline{TECN}_{-} E791 CLE2 | $\begin{array}{c} D_{1}^{0} - \Gamma D_{2}^{0} / \Gamma D_{0}^{0} \\ p_{1}^{0} - \Gamma D_{2}^{0} / \Gamma D_{0}^{0} \\ p_{2}^{0} - \Gamma D_{2}^{0} \\ p_{2}^{0} - \Gamma D_{2}^{0} \\ p_{3}^{0} \\ p_{4}^{0} \\ p_{4}^{$ |
| that come from the transformation of tr | the best of $\frac{CL\%}{90}$ cay-time g. The f in this te is disallow π^{-} mod π^{-} mod $\frac{CL\%}{2}$ AVERA 007 025 me follow | mixing lim <u>DOC</u> 83 AIT, informatic it allows i erm. The o wed, the r e is doubl <u>6 EVTS</u> GE 19 ing data f | iit, see nea <u>UMENT ID</u> ALA on to distir nterference central val esult beco y Cabibboc <u>DOCC</u> 84 AITA 85 CINA | ar the l 98 nguish o e betw ue obta omes 0. o suppro <u>JMENT</u> ALA ABRO es, fits, | peginnin <u>TECN</u> E791 doubly C een the nined is 0 0021 ± essed. <u>D</u> 98 94 limits, e | $rac{0}{2}$ g of thes $rac{2}{2}$ g of thes $rac{2}{2}$ nucl abibbo-s two amp $rac{1}{2}$ $rac{1}{2}$ two amp $rac{1}{2}$ rac | $ \frac{D_{1}^{0} - D_{2}^{0}}{P_{2}^{0}} D_{0}^{0} $ se D^{0} Listings. $\frac{D}{D}$ leus, 500 GeV suppressed decays politudes, and also 0.0036 ± 0.0016 . ± 0.0002 . F155/F19 $ \frac{COMMENT}{\pi^{-} \text{ nucleus,}} $ $ \frac{500 \text{ GeV}}{e^{+}e^{-}} \approx T(4S)$ |
| that come from the transformation of the theorem in the theorem in the transformation is the transform $D^0 - \overline{D}^0$ mixing allows CP violation when interference is $\Gamma(K^+\pi^-)/\Gamma(K^-\pi^-)$ The $D^0 \rightarrow K^+$ is the $D^0 \rightarrow K^+$ is the $D^0 \rightarrow K^+$ is the transformation of transformation of the transformation of transformation of transformation of the transformation of transforma | the best in CL% 90 cay-time g. The f in this te is disallow $\pi^{-} \mod CL\%$ CL% R AVERA 007 025 me follow 90 | mixing lim <u>DOC</u> 83 AIT, informatic it allows i erm. The o wed, the ro e is doubl <u>5 EVTS</u> IGE 19 ing data f | it, see nea <u>UMENT ID</u> ALA on to distir nterference central val esult becco y Cabibbec <u>DOCU</u> 84 AITA 85 CINA for average 85 AMN | ar the I 98 nguish o e betw ue obta omes 0. 0 suppro <u>JMENT</u> ALA ABRO es, fits, MAR | peginnin <u>TECN</u> E791 doubly C een the ined is 0 0021 ± essed. D 98 94 limits, e 91 | $rac{0}{2}$ and $rac{1}{2}$ g of thes \underline{COMMEN} π^{-} nucl abibbo-s two amp 0.0039^+ $0.0009^$ $0.0009^$ \underline{TECN} E791 CLE2 etc. • • CLEO | $\begin{array}{c} D_{1}^{0} - \Gamma D_{2}^{0} / \Gamma D_{2}^{0} \\ D_{1}^{0} - \Gamma D_{2}^{0} / \Gamma D_{2}^{0} \\ \text{se } D^{0} \text{ Listings.} \\ \hline D_{1}^{0} & \text{Listings.} \\ \hline D_{1}^{0} $ |
| that come from the transformation of the transformation $VALUE$ <0.0085 ⁸³ AITALA 98 uses decomposed from $D^0 - \overline{D}{}^0$ mixing allows <i>CP</i> violation When interference in the transformation of transformation of the transformation of | the best of $\frac{CL\%}{90}$ cay-time g. The f in this te is disallow π^{-} mod $\frac{CL\%}{2}$ AVERA 0007 025 ne follow 90 90 | mixing lim <u>DOC</u> 83 AIT, informatic it allows i erm. The o wed, the r e is doubl <u>5 EVTS</u> IGE 19 ing data f 1 ± 6 | iit, see nea <u>UMENT ID</u> ALA on to distir nterference central val esult beco y Cabibboc <u>DOCU</u> 84 AITA 85 CINA for average 85 AMN 86 ANJ | ar the I 98 nguish o e betw ue obta omes 0. 0 suppro <u>JMENT</u> ALA ABRO es, fits, MAR OS | peginnin <u>TECN</u> E791 doubly C een the ined is 0 0021 ± essed. <u>D</u> 98 94 limits, e 91 880 | $\frac{0}{2}$ and $\frac{1}{2}$ g of thes $\frac{2}{2}$ g of thes $\frac{2}{2}$ mathemath{m | $\begin{array}{c} D_{1}^{0} - \Gamma D_{2}^{0} ^{\prime \Gamma} D^{0} \\ p_{1}^{0} - \Gamma D_{2}^{0} ^{\prime \Gamma} D^{0} \\ p_{2}^{0} \\ p_{2}^{0} \\ p_{3}^{0} \\ p_{4}^{0} \\ p$ |
| that come from the transformation of the theorem in the transformation $VALUE$ <0.0085 ⁸³ AITALA 98 uses decomposed from $D^0 - \overline{D}^0$ mixing allows <i>CP</i> violation When interference in the transformation of transformation of the transformation of transformat | the best in $\frac{CL\%}{90}$ cay-time g. The f in this te is disallow π^{-} mod $\frac{CL\%}{2}$ AVERA 0007 025 the follow 90 90 00 | mixing lim <u>DOC</u> 83 AIT, informatic it allows i erm. The o wed, the re- e is double <u>5 EVTS</u> GE 19 ing data f 1 ± 6 | iit, see nei <u>UMENT ID</u> ALA on to distir nterferenc central val esult beco y Cabibbo <u>DOCU</u> 84 AITA 85 CINA or average 85 AMN 86 ANJ 87 AIR | ar the I 98 nguish o e betw ue obta omes 0. 0 suppro <u>JMENT</u> ALA ABRO es, fits, MAR OS | $r_1 D$ $r_2 D$ r | $rac{0}{2}$ g of thes $rac{2}{2}$ g of thes $rac{2}{2}$ much $rac{2}{3}$ much $ ac{2}{3}$ much | $\begin{array}{c} D_{1}^{O} - D_{2}^{O} / D_{0}^{O} \\ D_{1}^{O} - D_{2}^{O} / D_{0}^{O} \\ \end{array}$ se D^{0} Listings. $\begin{array}{c} D_{1}^{O} & D_{2}^{O} / D_{0}^{O} \\ \end{array}$ suppressed decays plitudes, and also 0.0036 \pm 0.0016 0.0032 \pm 0.0016 \pm 0.0002. $\Gamma_{155} / \Gamma_{19} \\ \hline \\ \frac{COMMENT}{\pi^{-} \text{ nucleus,}} \\ \frac{500 \text{ GeV}}{\text{GeV}} \\ e^{+} e^{-} \approx 10.5 \\ \hline \\ \text{GeV} \\ Photoproduction \\ e^{+} e^{-} 10 \text{ GeV} \end{array}$ |
| that come from the transformation of the transformation in the transformation is the transformation in the transform $D^0 - \overline{D}^0$ mixing allows CP violation. When interference is $\Gamma(K^+\pi^-)/\Gamma(K^-\pi^-)$ The $D^0 \rightarrow K^+$. The $D^0 \rightarrow K^+$ and the D^0 \rightarrow K^+. The $D^0 \rightarrow K^+$. The $D^0 \rightarrow K^+$ and the D^0 \rightarrow K^+. The $D^0 \rightarrow K^+$ and the D^0 \rightarrow K^+. The $D^0 \rightarrow K^+$ and the D^0 \rightarrow K^+. The $D^0 \rightarrow K^+$ and the D^0 \rightarrow K^+ and the D^0 \rightarrow K^+. The $D^0 \rightarrow K^+$ and the D^0 \rightarrow K^+ and the D^0 \rightarrow K^+. The D^0 \rightarrow K^+ and the D^0 \rightarrow K^+ and the D^0 \rightarrow K^+. The D^0 \rightarrow K^+ and the D^0 \rightarrow K^+ and the D^0 \rightarrow K^+. The D^0 \rightarrow K^+ and the D^0 \rightarrow K^+ and the D^0 \rightarrow K^+. | the best in $\frac{CL\%}{90}$ cay-time g. The f in this te is disallow π^- mod $\frac{CL\%}{2}$ AVERA 007 025 ne follow 90 90 90 90 90 | mixing lim <u>DOC</u> 83 AIT, informatic it allows i erm. The o wed, the re- e is doubly <u>5 EVTS</u> IGE 19 ing data f 1 ± 6 | iit, see nei <u>UMENT ID</u> ALA on to distir nterference central val esult beco y Cabibbo <u>DOCU</u> 84 AITA 85 CINA for average 85 AMN 86 ANJ 87 ALB 87 ARA | ar the I 98 nguish o e betw ue obta omes 0. o suppro <u>JMENT</u> ALA ABRO es, fits, MAR OS RECHT | 2 Deginnin <u>TECN</u> E791 doubly C een the ined is (0021 ± essed. 2 98 94 limits, e 91 880 - 876 880 | $rac{0}{2}$ and $rac{1}{2}$ g of thes $rac{2}{2}$ nucles abibbo-s two amp $rac{1}{2}$ nucles abibbo-s two amp $rac{1}{2}$ nucles two amp $rac{1}{2}$ nucles $rac{1}{2}$ nucles $rac{1}{$ | $\begin{array}{c} D_{1}^{0} - P_{2}^{0} P_{0}^{0} P_{2}^{0} D_{0}^{0} \\ p_{2}^{0} D_{2}^{0} D_{0}^{0} \\ p_{2}^{0} D_{2}^{0} D_{0}^{0} \\ p_{3}^{0} p_{2}^{0} p_{3}^{0} \\ p_{4}^{0} p_{4}^{0} p_{4}^{0} \\ p_{4}^{0} p_{4}^{0} \\ p_{4}^{0} p_{4}^{0} \\ p_{4}^{0} p_{4}^{0} p_{4}^{0} p_{4}^{0} p_{4}^{0} \\ p_{4}^{0} p_{4}^{0} $ |
| that come from the transformed to the transform that come from the transformation $VALUE$ <0.0085 ⁸³ AITALA 98 uses decomposed from $D^0 - \overline{D}^0$ mixing allows <i>CP</i> violation. When interference is the transformation V when interference is the transformation $\Gamma(K^+\pi^-)/\Gamma(K^-\pi^$ | the best in CL% 90 cay-time g. The f in this te is disallow π^{-} mod CL% π^{-} mod CL% 007 025 the follow 90 | mixing lim <u>DOC</u> 83 AIT, informatic it allows i erm. The c wed, the r e is doubl <u>5 EVTS</u> IGE 19 ing data f 1 ± 6 | iit, see nea <u>UMENT ID</u> ALA on to distir nterference central val esult becco y Cabibbec <u>DOCU</u> 84 AITA 85 CINA 60 ANJA 86 ANJA 87 ALB 87 ABA 88 RAII | ALA ABRO ALA ABRO ALA ABRO ES, fits, MAR OS RECHT CHI FY | $rac{1}{2}$ D beginnin TECN E791 Joubly C een the ined is (0021 \pm 98 94 limits, e 91 88C - 87k 86C 86 | $rac{0}{2}$ and $rac{1}{2}$ g of thes \underline{COMMEA} π^{-} nucl abibbo-s two amp 0.0039^+ $0.0009^-=$ \underline{TECN} E791 CLE2 etc. • • CLE0 E691 ARG HRS ACCM | $\begin{array}{c} D_{1}^{0} - \Gamma D_{2}^{0} 7 D_{0}^{0} \\ D_{1}^{0} - D_{2}^{0} 7 D_{0}^{0} \\ \end{array}$ Se D^{0} Listings. \overline{D} leus, 500 GeV suppressed decays politudes, and also 0.0036 ± 0.0016 $\pm 0.0002.$ Γ_{155}/Γ_{19} $\underline{COMMENT}$ π^{-} nucleus, 500 GeV $e^{+}e^{-} \approx 10.5$ GeV Photoproduc- tion $e^{+}e^{-}$ 10 GeV $e^{+}e^{-}$ 29 GeV π^{-} Be fixed |
| that come from the transformation of the transformation $VALUE$ <0.0085 ⁸³ AITALA 98 uses decomposed from $D^0 - \overline{D}^0$ mixing allows <i>CP</i> violation. When interference is the transformation of transformation of the transformation of | the best of $\frac{CL\%}{90}$ cay-time g. The f in this terms of the follow π^{-1} mod $\frac{CL\%}{1007}$ 025 the follow 90 90 90 90 90 90 90 90 90 90 90 | mixing lim <u>DOC</u> 83 AIT, informatic it allows i erm. The o wed, the re- e is double <u>5 EVTS</u> GE 19 ing data f 1 ± 6 0 | nit, see nea <u>UMENT ID</u> ALA on to distir nterference central val esult beco y Cabibbec <u>DOCU</u> 84 AITA 85 CINA 86 ANJA 86 ANJA 87 ALB 87 ABA 88 BAIL | ALA ABRO ALA ABRO ALA ABRO CHI CHI LEY | $rac{F}{2}$ Deginnin TECN E791 doubly C een the ined is (0021 ± 98 94 limits, e 91 88C - 87k 86D 86 | $rac{0}{2}$ and $rac{1}{2}$ g of thes $rac{2}{2}$ g of thes $rac{2}{2}$ g of thes $rac{2}{2}$ mathemathemathemathemathemathemathemathe | $\begin{array}{c} D_{1}^{0} - \Gamma D_{2}^{0} / \Gamma D_{0}^{0} \\ p_{1}^{0} - \Gamma D_{2}^{0} / \Gamma D_{0}^{0} \\ p_{2}^{0} \\ p_{2}^{0} \\ p_{3}^{0} \\ p_{4}^{0} \\ p_{$ |

| <0.081 | 90 | ^{87,89} YAMAMOTO | 85 DLCO | e^+e^- 29 GeV |
|--------|----|----------------------------|----------|--|
| <0.23 | 90 | ^{87,89} ALTHOFF | 84B TASS | e ⁺ e ⁻ 34.4 |
| <0.11 | 90 | ^{87,89} AVERY | 80 SPEC | ${\displaystyle \stackrel{{\sf GeV}}{\gamma}} {\scriptstyle {\sf N}} ightarrow {\scriptstyle {\sf D}}^{*+}$ |
| <0.16 | 90 | ^{87,89} FELDMAN | 77b MRK1 | e^+e^- 4 GeV |
| <0.18 | 90 | ^{87,89} GOLDHABER | 77 MRK1 | e^+e^- 4 GeV |
| | | | | |

⁸⁴ AITALA 98 uses the charge of the pion in $D^{*\pm} \rightarrow (D^0 \text{ or } \overline{D}^0) \pi^{\pm}$ to tell whether a D^0 or a \overline{D}^0 was born. This result assumes no $D^0-\overline{D}^0$ mixing; it becomes $0.0090^+0.0120_{-0.0109} \pm$ 0.0044 when mixing is allowed and decay-time information is used to distinguish doubly Cabibbo-suppressed decays from mixing.

⁸⁵ These experiments cannot distinguish between doubly Cabibbo-suppressed decay and $D^0 - \overline{D}^0$ mixing.

⁸⁶ ANJOS 88C uses decay-time information to distinguish doubly Cabibbo-suppressed (DCS) decays from $D^0 - \overline{D}^0$ mixing. However, the result assumes no interference between the

DCS and mixing amplitudes. When interference is allowed, the limit degrades to 0.049. ⁸⁷ In these measurements, the charge of the pion in $D^{*\pm} \rightarrow (D^0 \text{ or } \overline{D}^0)\pi^{\pm}$ is used to tell whether a D^0 or a \overline{D}^0 was born. None of the measurements can distinguish between double Cabibbo suppression and mixing for the decay.

⁸⁸ BAILEY 86 searches for events with an oppositely charged eK pair. The limit is actually for $\Gamma(D^0 \to K^+ \pi^- \text{ or } K^+ \pi^- \pi^+ \pi^-)/\Gamma(D^0 \to K^- \pi^+ \text{ or } K^- \pi^+ \pi^+ \pi^-).$ ⁸⁹ The results are given as $\Gamma(K^+ \pi^-)/[\Gamma(K^- \pi^+) + \Gamma(K^+ \pi^-)]$ but do not change signif-

icantly for our denominator.

$\Gamma(K^+\pi^-(\text{via}\,\overline{D}^0))/\Gamma(K^-\pi^+)$

 Γ_{156}/Γ_{10}

| ١ | | | |
|----------|--|---|--|
| | This is a $D^0 - \overline{D}^0$ mixing limit. For the | e limits on $ig m_{D_1^0} - m_{D_2^0}ig $ and $ig \Gamma_{D_1^0} - m_{D_2^0}ig $ | $\left \Gamma_{D_2^0} \right / \Gamma_{D^0}$ |
| | that come from the best mixing limit | , see near the beginning of these $D^{m 0}$ | Listings. |

| VALUE | CL% | EVTS | DOCUMENT ID | TECN | COMMENT |
|--------|-----|---------|---------------------|----------|-----------------|
| <0.005 | 90 | 1 ± 4 | ⁹⁰ ANJOS | 88C E691 | Photoproduction |

⁹⁰ ANJOS 88C uses decay-time information to distinguish doubly Cabibbo-suppressed (DCS) decays from $D^0 - \overline{D}^0$ mixing. However, the result assumes no interference between the DCS and mixing amplitudes. When interference is allowed, the limit degrades to 0.019. Combined with results on $K^{\pm}\pi^{\mp}\pi^{+}\pi^{-}$, the limit is, assuming no interference, 0.0037.

| $\Gamma(K^+\pi^-\pi^+\pi^-)/\Gamma($ | $K^{-}\pi^{+}$ | $\pi^{+}\pi^{-})$ | | | | Г ₁₅₇ /Г ₃₇ |
|---|----------------|-------------------|------------------------|---------|----------|-----------------------------------|
| VALUE | <u>CL%</u> | EVTS | DOCUMENT ID | | TECN | COMMENT |
| $0.0025^{+0.0036}_{-0.0034}\pm0.00$ | 03 | | ⁹¹ AITALA | 98 | E791 | π^{-} nucleus, 500 GeV |
| \bullet \bullet \bullet We do not use the | e followir | ng data fo | or averages, fits, lir | nits, o | etc. • • | • |
| <0.018 | 90 | | ⁹² AMMAR | 91 | CLEO | $e^+e^- \approx 10.5$ |
| <0.018 | 90 | 5 ± 12 | ⁹³ ANJOS | 880 | E691 | GeV Photoproduc- tion |

⁹¹ AITALA 98 uses the charge of the pion in $D^{*\pm} \rightarrow (D^0 \text{ or } \overline{D}{}^0) \pi^{\pm}$ to tell whether a D^0 0.0035 when mixing is allowed and decay-time information is used to distinguish doubly Cabibbo-suppressed decays from mixing.

 92 AMMAR 91 cannot distinguish between doubly Cabibbo-suppressed decay and $D^0-\overline{D}^0$ mixing.

93 ANJOS 88C uses decay-time information to distinguish doubly Cabibbo-suppressed (DCS) decays from $D^0 - \overline{D}^0$ mixing. However, the result assumes no interference between the DCS and mixing amplitudes. When interference is allowed, the limit degrades to 0.033.

| $\Gamma(K^+\pi^-\pi^+\pi^-)$ | - (via <mark>7</mark> | <u>ס))/ר(/</u> | $(K^{-}\pi^{+}\pi^{+}\pi^{-})$ | | | Г ₁₅₈ /Г ₃₇ |
|---|---|---|--|-------------------------------------|---|---|
| This is a $D^{(}$ | $-\overline{D}^0$ mi | xing limit. | For the limits o | י <i>ו</i> שר | $p_{0}^{0} - m_{1}$ | D_{0}^{0} and $ \Gamma_{D_{0}}^{0} - \Gamma_{D_{0}}^{0} /\Gamma_{D_{0}}^{0}$ |
| that come f | from the | e best mix | ing limit, see nea | r the | beginnii | ng of these D^0 Listings. |
| | | 1 ± 1 | 4 ANLIOS | 880 | F601 | Photoproduction |
| 94 | 90 0 | /⊥4 .• · c | ANJOS | | L091 | |
| decays from <i>L</i> DCS and mix Combined wit | Ses decay D ⁰ -D ⁰ ing amp h results | y-time info mixing. H litudes. W s on $K^{\pm}\pi$ | ormation to distin owever, the resu /hen interference -∓, the limit is, a | guish lt ass is alle assum | doubly umes no owed, th ing no i | Cabibbo-suppressed (DCS) o interference between the ne limit degrades to 0.007. nterference, 0.0037. |
| $\Gamma(\mu^-$ anything | (via \overline{D}^0 | ⁰))/Г(µ [⊣] | anything) | | | Γ ₁₅₉ /Γ ₂ |
| This is a D | ⁰ - <i>D</i> ⁰ m | ixing limit | . See the somew | hat b | etter lin | nits above. |
| | | 00 | | 06 | | |
| • • • We do not | use the | following | data for average | ou s, fits | , limits, | π vv 225 GeV etc. • • • |
| < 0.012 | | 90 | BENVENUTI | 85 | CNTR | u.C. 200 GeV |
| <0.044 | | 90 | BODEK | 82 | SPEC | π^- , pFe $\rightarrow D^0$ |
| $\Gamma(e^+e^-)/\Gamma_{\text{total}}$ A test for t | he ΔC | = 1 weak | neutral current. | Allov | ved by f | Γ ₁₆₀ /Γ irst-order weak interaction |
| combined w | CL% | tromagnet <i>EVTS</i> | DOCUMENT ID | | TECN | COMMENT |
| <1.3 × 10 ⁻⁵ | 90 | 0 | FREYBERGER | 8 96 | CLE2 | $e^+e^- \approx \Upsilon(4S)$ |
| • • • We do not | use the | following | data for average | s, fits | , limits, | etc. • • • |
| $< 1.3 	imes 10^{-4}$ | 90 | | ADLER | 88 | MRK3 | e ⁺ e ⁻ 3.77 GeV |
| $< 1.7 \times 10^{-4}$ | 90 | 7 | ALBRECHT | 88 G | ARG | e^+e^- 10 GeV |
| $< 2.2 \times 10^{-4}$ | 90 | 8 | HAAS | 88 | CLEO | e ⁺ e ⁻ 10 GeV |
| $\Gamma(\mu^+\mu^-)/\Gamma_{tot}$ A test for t combined w | al he ΔC : vith elec | = 1 weak tromagnet | neutral current. | Allov | ved by f | Γ₁₆₁/Γ irst-order weak interaction |
| VALUE | <u>CL%</u> | <u>EVTS</u> | DOCUMENT ID | | TECN | COMMENT |
| $<4.1 \times 10^{-6}$ | 90 | | ADAMOVICH | 97 | BEAT | π^- Cu, W 350 GeV |
| • • • We do not | use the | following | data for average | s, fits | , limits, | etc. • • • |
| $< 4.2 \times 10^{-6}$ | 90 | | ALEXOPOU | 96 | E771 | p Si, 800 GeV |
| $< 3.4 \times 10^{-5}$ | 90 | 1 | FREYBERGEF | R 96 | CLE2 | $e^+e^-pprox~\Upsilon(4S)$ |
| $< 7.6 \times 10^{-6}$ | 90 | 0 | ADAMOVICH | 95 | BEAT | See ADAMOVICH 97 |
| $<4.4 \times 10^{-5}$ | 90 | 0 | KODAMA | 95 | E653 | π^- emulsion 600 GeV |
| $< 3.1 \times 10^{-5}$ | 90 | ç | ^{/5} MISHRA | 94 | E789 | -4.1 ± 4.8 events |
| $< 7.0 \times 10^{-5}$ | 90 | 3 | ALBRECHT | 88 G | ARG | <i>e</i> + <i>e</i> - 10 GeV |
| $< 1.1 \times 10^{-5}$ | 90 | | LOUIS | 86 | SPEC | π^- W 225 GeV |
| $< 3.4 \times 10^{-4}$ | 90 | | AUBERT | 85 | EMC | Deep inelast. $\mu^- N$ |
| ⁹⁵ Here MISHRA approach, givi | 94 uses ng a lin | ; "the stat nit of 9 $	imes$ | istical approach a 10 ^{—6} at 90% co | ndvoca nfider | ated by t ice level | the PDG." For an alternate , see the paper. |
| $\Gamma(\pi^0 e^+ e^-)/\Gamma$ | total the ΔC | = 1 wea | k neutral current | :. All | owed by | Γ ₁₆₂ /Γ y higher-order electroweak |
| VALUE | <u>C</u> L% | <u>EVT</u> S | <u>DOC</u> UMENT ID | | <u>TE</u> CN | <u>COMMENT</u> |
| <4.5 × 10 ⁻⁵ | 90 | 0 | FREYBERGER | 8 96 | CLE2 | $e^+e^- \approx \Upsilon(4S)$ |
| HTTP://PDG. | LBL.G | OV | Page 40 | | Crea | ted: 6/29/1998 12:22 |

 $\Gamma(\pi^0 \mu^+ \mu^-)/\Gamma_{\text{total}}$ Γ_{163}/Γ A test for the $\Delta C=1$ weak neutral current. Allowed by higher-order electroweak interactions. CL% EVTS VALUE DOCUMENT ID TECN COMMENT <1.8 × 10⁻⁴ 90 2 KODAMA 95 E653 π^- emulsion 600 GeV \bullet \bullet \bullet We do not use the following data for averages, fits, limits, etc. \bullet \bullet $< 5.4 \times 10^{-4}$ 90 3 FREYBERGER 96 CLE2 $e^+e^- \approx \Upsilon(4S)$ $\Gamma(\eta e^+ e^-)/\Gamma_{\text{total}}$ Γ₁₆₄/Γ A test for the $\Delta C = 1$ weak neutral current. Allowed by higher-order electroweak interactions. VALUE CL% TECN COMMENT EVTS DOCUMENT ID <1.1 × 10⁻⁴ 90 0 FREYBERGER 96 CLE2 $e^+e^- \approx \Upsilon(4S)$ $\Gamma(\eta \mu^+ \mu^-)/\Gamma_{\text{total}}$ Γ_{165}/Γ A test for the $\Delta C = 1$ weak neutral current. Allowed by higher-order electroweak interactions. VALUE CL% EVTS DOCUMENT ID ____<u>TECN___COMMENT</u> $< 5.3 \times 10^{-4}$ FREYBERGER 96 CLE2 $e^+e^- \approx \Upsilon(4S)$ 90 0 $\Gamma(\rho^0 e^+ e^-) / \Gamma_{\text{total}}$ Γ_{166}/Γ A test for the $\Delta C = 1$ weak neutral current. Allowed by higher-order electroweak interactions. VALUE DOCUMENT ID TECN COMMENT CL% EVTS $<1.0 \times 10^{-4}$ ⁹⁶ FREYBERGER 96 CLE2 $e^+e^- \approx \Upsilon(4S)$ 90 2 • • • We do not use the following data for averages, fits, limits, etc. • • • $< 4.5 \times 10^{-4}$ 88 CLEO e^+e^- 10 GeV 90 2 HAAS ⁹⁶ This FREYBERGER 96 limit is obtained using a phase-space model. The limit changes to $< 1.8 \times 10^{-4}$ using a photon pole amplitude model. $\Gamma(\rho^0 \mu^+ \mu^-)/\Gamma_{\rm total}$ Γ_{167}/Γ A test for the $\Delta C = 1$ weak neutral current. Allowed by higher-order electroweak interactions. <u>VALU</u>E CL% EVTS DOCUMENT ID <u>TECN</u><u>COMMENT</u> $< 2.3 \times 10^{-4}$ 90 0 **KODAMA** 95 E653 π^- emulsion 600 GeV • • • We do not use the following data for averages, fits, limits, etc. • • • $< 4.9 \times 10^{-4}$ ⁹⁷ FREYBERGER 96 CLE2 $e^+e^- \approx \Upsilon(4S)$ 1 90 $< 8.1 \times 10^{-4}$ 88 CLEO e^+e^- 10 GeV HAAS 90 5 ⁹⁷ This FREYBERGER 96 limit is obtained using a phase-space model. The limit changes to $< 4.5 \times 10^{-4}$ using a photon pole amplitude model. $\Gamma(\omega e^+ e^-)/\Gamma_{\text{total}}$ Γ_{168}/Γ A test for the $\Delta C = 1$ weak neutral current. Allowed by higher-order electroweak interactions. VALUE DOCUMENT ID TECN COMMENT <u>CL%</u> EVTS <1.8 × 10⁻⁴ ⁹⁸ FREYBERGER 96 CLE2 $e^+e^- \approx \Upsilon(4S)$ 90 1

⁹⁸ This FREYBERGER 96 limit is obtained using a phase-space model. The limit changes to $< 2.7 \times 10^{-4}$ using a photon pole amplitude model.

| $\Gamma(\omega \mu^+ \mu^-)/\Gamma_{ta}$ | otal | 1 | | A 11 | | | Г ₁₆₉ /Г |
|---|---|-----------------------------|--------------------------------------|---------------|--------------------------|-------------------------------|---|
| interactions | ine ΔC : | = 1 wear | c neutral current. | Allo | owed by | / nigner- | order electroweak |
| VALUE | <u>CL%</u> E | <u>EVTS</u> | DOCUMENT ID | | TECN | <u>COMMEI</u> | VT |
| $< 8.3 \times 10^{-4}$ | 90 | 0 9 | ⁹ FREYBERGER | 96 | CLE2 | e ⁺ e ⁻ | $\approx~\Upsilon(4S)$ |
| 99 This FREYBE to $< 6.5 \times 10^{\circ}$ | RGER 9 ⁻⁴ using | 6 limit is ; a photor | obtained using a n pole amplitude | phase mode | e-space el. | model. | The limit changes |
| $\Gamma(\phi e^+ e^-) / \Gamma_{to}$ A test for t | tal the ΔC is | = 1 weak | neutral current. | Alle | owed by | / higher- | F₁₇₀/F order electroweak |
| interactions VALUE | | <u>VTS</u> | DOCUMENT ID | | TECN | <u>COMMEI</u> | VT |
| <5.2 × 10 ^{—5} | 90 | 2 10 | ⁰ FREYBERGER | 96 | CLE2 | e ⁺ e ⁻ | $\approx \Upsilon(4S)$ |
| 100 This FREYBE to $< 7.6 	imes 10^{\circ}$ | RGER 9 ^{—5} using | 6 limit is ; a photor | obtained using a 1 pole amplitude | phase mode | e-space el. | model. | The limit changes |
| $\left(\phi \mu^+ \mu^-\right) / \Gamma_{ta}$ A test for t | tal the ΔC | = 1 weak | neutral current. | Alle | owed by | / higher- | Γ ₁₇₁ /Γ order electroweak |
| interactions | (1% F | VTS | DOCUMENT ID | | TECN | COMME | NT |
| $<4.1 \times 10^{-4}$ | <u>90</u> | 0 10 | ¹ FREYBERGER | 96 | CLE2 | e ⁺ e ⁻ | $\approx \Upsilon(4.5)$ |
| 101 This FREYBE to $< 2.4 \times 10^{-1}$ | RGER 9 ⁻⁴ using | 6 limit is g a photor | obtained using a n pole amplitude | phase mode | e-space el. | model. | The limit changes |
| $\overline{(K^0 e^+ e^-)}/\Gamma$ | total first-orde | er weak in | teraction combin | ed wi | ith elect | romagne | Γ ₁₇₂ /Γ |
| ALUE | <u>CL%</u> E | <u>EVTS</u> | DOCUMENT ID | | TECN | <u>COMMEI</u> | NT |
| <1.1 × 10 ⁻⁴ | 90 use the f | 0 Following | FREYBERGER data for averages | 96 , fits, | CLE2 limits. | e^+e^- etc. •• | $\approx \Upsilon(4S)$ |
| $< 1.7 \times 10^{-3}$ | 90 | 0 | ADLER | 89C | MRK3 | e^+e^- | 3.77 GeV |
| $(\overline{K}^{0}\mu^{+}\mu^{-})/\Gamma$ | - total | www.woold in | toraction combin | od | th alact | | Γ ₁₇₃ /Γ |
| Allowed by | CL% E | EVTS | DOCUMENT ID | | TECN | COMMEI | VT |
| <2.6 × 10 ⁻⁴ | 90 | 2 | KODAMA | 95 | E653 | π^- em | ulsion 600 GeV |
| • • We do not | use the f | - ollowing | data for averages | , fits, | limits, | etc. • • | • |
| $< 6.7 \times 10^{-4}$ | 90 | 1 | FREYBERGER | 96 | CLE2 | e^+e^- | $\approx~\Upsilon(4S)$ |
| -(K*(892) ⁰ e+ Allowed by | e[—])/Γ_t first-orde | t otal er weak in | teraction combin | ed wi | ith elect <i>TFCN</i> | romagne <i>COMMEI</i> | Γ₁₇₄/Γ etic interaction. |
| <1.4 × 10 ⁻⁴ | 90 | 1 10 | ² FREYBERGER | 96 | CLE2 | e ⁺ e ⁻ | $\approx \Upsilon(4S)$ |
| $^{.02}$ This FREYBE to $< 2.0 \times 10^{-10}$ | RGER 9 | 6 limit is ; a photor | obtained using a n pole amplitude | phase mode | e-space el. | model. | The limit changes |
| -(Κ *(892) ⁰ μ+ Allowed by | μ [—])/Γ | total er weak in | teraction combin | ed wi | ith elect | romagne | Γ ₁₇₅ /Γ tic interaction. |
| /ALUE | <u>CL%</u> E | <u>EVTS</u> | <u>DOCUMENT ID</u> | | <u>TECN</u> | <u>COMMEI</u> ⊥ | NT |
| <1.18 × 10 ⁻³ | 90 | 1 10 | ~ FREYBERGER | 96 | CLE2 | e⊤ e¯ | $\approx T(4S)$ |
| to $< 1.0 \times 10^{100}$ | RGER 9 -3 using | 6 limit is g a photor | obtained using a n pole amplitude | phase mode | e-space el. | model. | The limit changes |
| HTTP://PDG. | LBL.GC | V | Page 42 | | Crea | ted: 6/ | 29/1998 12:22 |

| $(\pi^+\pi^-\pi^-\mu)$ A test for | $\mu^{-})/1$ | total =1 weak | neutral current. Allo | owed | by high | er-order electroweak inter- |
|---|---|-------------------------|--|-------------|------------------------|---|
| actions. | | 1 Weak | | onea | by mgn | |
| /ALUE | <u>CL%</u> | <u>EVTS</u> | DOCUMENT ID | | TECN | COMMENT |
| <8.1 × 10 ⁻⁴ | 90 | 1 | KODAMA | 95 | E653 | π^- emulsion 600 GeV |
| $\left(\mu^{\pm} e^{\mp}\right)/\Gamma_{to}$ | tal | | | | | Г ₁₇₇ /Г |
| A test of l | epton fa | mily num | ber conservation. | | TECH | COMMENT |
| <u>ALUE</u> | <u> </u> | EVIS | 104 | | | |
| $< 1.9 \times 10^{-3}$ | 90 | 2 | FREYBERGER | 96 | CLE2 | $e^+e^-\approx T(4S)$ |
| • • We do not | t use the | followin | g data for averages | , tits | , limits, | etc. • • • |
| $< 1.0 \times 10^{-4}$ | 90 | 4 | ALBRECHT | 88 G | ARG | e ⁺ e ⁻ 10 GeV |
| $< 2.7 \times 10^{-4}$ | 90 | 9 | HAAS | 88 | CLEO | e ⁺ e ⁻ 10 GeV |
| $< 1.2 \times 10^{-4}$ | 90 | | BECKER | 87C | MRK3 | e^+e^- 3.77 GeV |
| $< 9 \times 10^{-4}$ | 90 | | PALKA | 87 | SILI | 200 GeV π <i>p</i> |
| $< 21 \times 10^{-4}$ | 90 | 0 | ¹⁰⁵ RILES | 87 | MRK2 | e ⁺ e ⁻ 29 GeV |
| 04 This is the e | orrected | result of | ven in the errotum | | | CER 06 |
| 05 RILES 87 ~~ | | $(D = \sqrt{k})$ | $(\pi) = 3.0\%$ and ha | c nr | | model dependency |
| <u>ALUE</u> | <u> </u> | <u>EVTS</u> | DOCUMENT ID | 00 | <u>TECN</u> | $\frac{COMMENT}{+} = 2 \cdot 2^{\circ}(AC)$ |
| $< 8.6 \times 10^{-5}$ | 90 | 2 | FREYBERGER | 96 | CLE2 | $e^+e^- \approx T(4S)$ |
| (η e[±] μ[∓])/Γ A test of charge stat ALUE | total lepton fa tes. <u>CL%</u> | amily nu <u>EVTS</u> | mber conservation. <u>DOCUMENT ID</u> | The | e value <u>TECN</u> | Γ₁₇₉/Γ is for the sum of the two <u>COMMENT</u> |
| <1.0 × 10 ⁻⁴ | 90 | 0 | FREYBERGER | 96 | CLE2 | $e^+e^-pprox \Upsilon(4S)$ |
| $(\rho^0 e^{\pm} \mu^{\mp})/l$ | total | | | — . | | Г ₁₈₀ /Г |
| A test of | lepton fa | amily nu | mber conservation. | Ine | e value | is for the sum of the two |
| ALLIF | CI% | FVTS | DOCUMENT ID | | TECN | COMMENT |
| A 0 × 10 ⁻⁵ | <u> </u> | 0 | 106 EREVBERGER | 96 | | $e^+e^- \sim \Upsilon(4S)$ |
| 06 | 90 | 0 | | 90 | CLLZ | $e^{-}e^{-} \sim T(+3)$ |
| to $< 5.0 \times 10^{\circ}$ | ERGER 0 ^{—5} usir | 96 limit 1g a pho | is obtained using a ton pole amplitude | phas mod | se-space el. | model. The limit changes |
| $(\omega e^{\pm} \mu^{\mp})/\Gamma$ A test of | total lepton fa | amily nu | mber conservation. | The | e value | F₁₈₁/f is for the sum of the two |
| ALUE | CL% | EVTS | DOCUMENT ID | | TECN | COMMENT |
| <1.2 × 10 ⁻⁴ | 90 | 0 | ¹⁰⁷ FREYBERGER | 96 | CLE2 | $e^+e^-pprox \Upsilon(4S)$ |
| 07 This EREVR | | 96 limit | is obtained using a | nha | <u>60_60000</u> | model The same limit is |
| obtained usir | ig a pho | ton pole | amplitude model. | pila | se-space | |

| Γ(φe [±] μ [∓])/Γt A test of I charge stat | otal epton famil <u>y</u> es. | y number co | iservation. | The value | is for the sum | Γ₁₈₂/Γ of the two |
|---|---|---------------------------------|-----------------------------|----------------------|------------------------------|--|
| VALUE | <u>CL%</u> EV7 | <u>-s</u> | JMENT ID | TECN | COMMENT | |
| $< 3.4 \times 10^{-5}$ | 90 | 0 ¹⁰⁸ FRE | YBERGER 9 | 6 CLE2 | $e^+e^-pprox \Upsilon(e^+)$ | 4 <i>S</i>) |
| 108 This FREYBE to $< 3.3 	imes 10$ | ERGER 96 I) ^{—5} using a | imit is obtain photon pole | ed using a p amplitude m | hase-space 10del. | model. The lin | nit changes |
| Γ(K⁰e[±]μ [∓])/ A test of I charge stat | F_{total} epton famil <u>y</u> es. | y number co | iservation. | The value | is for the sum | Γ₁₈₃/Γ of the two |
| VALUE | <u>CL% EV</u> 7 | <u> </u> | JMENT ID | TECN | COMMENT | |
| $< 1.0 \times 10^{-4}$ | 90 | 0 FRE | YBERGER 9 | 96 CLE2 | $e^+e^-pprox~\Upsilon(e^+)$ | 4 <i>S</i>) |
| Γ(Κ *(892) ⁰ e [±] A test of I charge stat | ^Ξ μ [∓])/Γ _{tot} epton famil | al y number co | nservation. | The value | is for the sum | Γ₁₈₄/Γ of the two |
| VALUE | <u>CL%EV7</u> | <u></u> | JMENT ID | TECN | <u>COMMENT</u> | |
| <1.0 × 10 ⁻⁴ | 90 | 0 ¹⁰⁹ FRE | YBERGER 9 | 6 CLE2 | $e^+e^-pprox \gamma(e^+e^-)$ | 4 <i>S</i>) |
| ¹⁰⁹ This FREYBI obtained usin | ERGER 96 I g a photon | imit is obtain pole amplitud | ed using a p le model. | hase-space | model. The sa | me limit is |
| D | ⁰ CP-VIO | LATING DE | CAY-RAT | | METRIES | |
| $A_{CP}(K^+K^-)$ | in <i>D</i> ⁰ , D ⁰ | $\rightarrow K^+K$ | | | | |

This is the difference between D^0 and \overline{D}^0 partial widths for these modes divided by the sum of the widths. The D^0 and \overline{D}^0 are distinguished by the charge of the parent $D^*: D^{*+} \rightarrow D^0 \pi^+$ and $D^{*-} \rightarrow D^0 \pi^-$.

| VALUE | <u>EVTS</u> | <u>DOCUMENT ID</u> | TECN | COMMENT |
|--------------------------|-------------|-----------------------|----------|----------------------------|
| 0.026 ± 0.035 OUR / | AVERAGE | | | |
| $-0.010\pm0.049\pm0.012$ | 2 609 | ¹¹⁰ AITALA | 98C E791 | $-0.093 < A_{CP} < +0.073$ |
| | | | | (90% CL) |
| $+0.080\pm0.061$ | | BARTELT | 95 CLE2 | $-0.022 < A_{CP} < +0.18$ |
| | | | | (90%CL) |
| $+0.024\pm0.084$ | | FRABET II | 941 E687 | $-0.11 < A_{CP} < +0.16$ |
| | | | | (90% CL) |

¹¹⁰ AITALA 98C and FRABETTI 94I measure $\textit{N}(D^0 \rightarrow \ \textit{K}^+ \textit{K}^-)/\textit{N}(D^0 \rightarrow \ \textit{K}^- \pi^+)$, the ratio of numbers of events observed, and similarly for the \overline{D}^0 .

$A_{CP}(\pi^+\pi^-)$ in D^0 , $\overline{D}{}^0 \rightarrow \pi^+\pi^-$

This is the difference between D^0 and \overline{D}^0 partial widths for these modes divided by the sum of the widths. The D^0 and \overline{D}^0 are distinguished by the charge of the parent $D^*: D^{*+} \rightarrow D^0 \pi^+$ and $D^{*-} \rightarrow D^0 \pi^-$. <u>EVTS</u> **19±0.078±0.030** 343 111 AITALA 98C E791 -0.186 <A_{CP} <

VALUE 98C E791 $-0.186 < A_{CP} < +0.088 (90\% CL)$ $-0.049 \pm 0.078 \pm 0.030$

¹¹¹ AITALA 98C measures $N(D^0 \rightarrow \pi^+ \pi^-)/N(D^0 \rightarrow K^- \pi^+)$, the ratio of numbers of events observed, and similarly for the \overline{D}^{0} .

HTTP://PDG.LBL.GOV

| $A_{CP}(K^0_S\phi)$ in D^0 | $D^{0}, \overline{D}^{0} \rightarrow K^{0}_{S} \phi$ | |
|--|---|--|
| This is the dif | ference between D^0 and \overline{D}^0 partial widths for these modes divided by | |
| the sum of the | widths. The D^0 and \overline{D}^0 are distinguished by the charge of the parent | |
| $D^*: D^{*+} \rightarrow$ | $D^0\pi^+$ and $D^{*-} \rightarrow D^0\pi^-$. | |
| VALUE | DOCUMENT ID TECN COMMENT | |
| -0.028 ± 0.094 | BARTELT 95 CLE2 $-0.182 < A_{CP} < +0.126$ (90%CL) | |
| $A_{CD}(K^0,\pi^0)$ in D | $\mu^0, \overline{D}^0 \rightarrow K^0, \pi^0$ | |
| | , | |
| This is the diff | ference between D^0 and \overline{D}^0 partial widths for these modes divided by | |
| This is the diff the sum of the | ference between D^0 and \overline{D}^0 partial widths for these modes divided by widths. The D^0 and \overline{D}^0 are distinguished by the charge of the parent | |
| This is the difference of the sum of the $D^*: D^{*+} \rightarrow D^*$ | ference between D^0 and \overline{D}^0 partial widths for these modes divided by widths. The D^0 and \overline{D}^0 are distinguished by the charge of the parent $D^0 \pi^+$ and $D^{*-} \rightarrow D^0 \pi^-$. | |
| This is the difference of the sum of the $D^*: D^{*+} \rightarrow NALUE$ | ference between D^0 and \overline{D}^0 partial widths for these modes divided by widths. The D^0 and \overline{D}^0 are distinguished by the charge of the parent $D^0 \pi^+$ and $D^{*-} \rightarrow D^0 \pi^-$. <u>DOCUMENT ID</u> <u>TECN</u> <u>COMMENT</u> | |

D^0 PRODUCTION CROSS SECTION AT $\psi(3770)$

A compilation of the cross sections for the direct production of D^0 mesons at or near the $\psi(3770)$ peak in e^+e^- production.

| VALUE (nanobarns) | DOCUMENT ID | | TECN | COMMENT |
|---|--|-----------------------|------------------------------|--|
| • • • We do not use the followi | ng data for averages | , fits, | limits, | etc. • • • |
| $\begin{array}{l} 5.8 \ \pm 0.5 \ \pm 0.6 \\ 7.3 \ \pm 1.3 \\ 8.00 \pm 0.95 \pm 1.21 \\ 11.5 \ \pm 2.5 \end{array}$ | ¹¹² ADLER ¹¹³ PARTRIDGE ¹¹⁴ SCHINDLER ¹¹⁵ PERUZZI | 88C 84 80 77 | MRK3 CBAL MRK2 MRK1 | e^+e^- 3.768 GeV e^+e^- 3.771 GeV e^+e^- 3.771 GeV e^+e^- 3.774 GeV |

¹¹² This measurement compares events with one detected *D* to those with two detected *D* mesons, to determine the the absolute cross section. ADLER 88C find the ratio of cross sections (neutral to charged) to be $1.36 \pm 0.23 \pm 0.14$.

- ¹¹³ This measurement comes from a scan of the $\psi(3770)$ resonance and a fit to the cross section. PARTRIDGE 84 measures 6.4 \pm 1.15 nb for the cross section. We take the phase space division of neutral and charged *D* mesons in $\psi(3770)$ decay to be 1.33, and we assume that the $\psi(3770)$ is an isosinglet to evaluate the cross sections. The noncharm decays (e.g. radiative) of the $\psi(3770)$ are included in this measurement and may amount to a few percent correction.
- ¹¹⁴ This measurement comes from a scan of the $\psi(3770)$ resonance and a fit to the cross section. SCHINDLER 80 assume the phase space division of neutral and charged *D* mesons in $\psi(3770)$ decay to be 1.33, and that the $\psi(3770)$ is an isosinglet. The noncharm decays (e.g. radiative) of the $\psi(3770)$ are included in this measurement and may amount to a few percent correction.
- ¹¹⁵ This measurement comes from a scan of the $\psi(3770)$ resonance and a fit to the cross section. The phase space division of neutral and charged D mesons in $\psi(3770)$ decay is taken to be 1.33, and $\psi(3770)$ is assumed to be an isosinglet. The noncharm decays (e.g. radiative) of the $\psi(3770)$ are included in this measurement and may amount to a few percent correction. We exclude this measurement from the average because of uncertainties in the contamination from τ lepton pairs. Also see RAPIDIS 77.

D⁰ REFERENCES

| AITALA | 98 | PR D57 13 | +Amato, Anjos, Appel+ | (FNAL E791 Collab.) |
|------------|------------|----------------------------|---|-------------------------|
| AITALA | 98C | PL B421 405 | +Amato, Anjos, Appel+ | (FNAL E791 Collab.) |
| AITALA | 98D | PL B423 185 | +Amato, Anjos, Appel+ | (FNAL E791 Collab.) |
| ARTUSO | 98 | PRL 80 3193 | M. Artuso+ | (CLEO Collab.) |
| PDG | 98 | EPJ C3 I | C. Caso+ | |
| | 97 07C | PL B408 409 DL B402 267 | +Alexandrov, Angelini+ | (CERN BEATRICE COLLAD.) |
| | 97C 06C | PRI 77 238/ | \pm Amoto Anios Appel \pm | (FNAL E701 Collab.) |
| | 90C 96C | PI B374 249 | +Hamacher Hofmann $+$ | (ARGUS Collab.) |
| ALEXOPOU | 96 | PRL 77 2380 | Alexopoulos, Antoniazzi+ | (FNAL E771 Collab.) |
| ASNER | 96B | PR D54 4211 | +Athanas, Bliss, Brower+ | (CLEO Collab.) |
| BARISH | 96 | PL B373 334 | +Chadha, Chan, Eigen+ | (CLEO Collab.) |
| FRABETTI | 96B | PL B382 312 | +Cheung, Cumalat+ | (FNAL E687 Collab.) |
| FREYBERGER | 96 | PRL 76 3065 | +Gibaut, Kinoshita+ | (CLEO Collab.) |
| Also | 96B | PRL 77 2147 (errata) | | |
| KUBOTA | 96B | PR D54 2994 | +Lattery, Nelson, Patton+ | (CLEO Collab.) |
| ADAMOVICH | 95 | PL B353 563 | +Adınolfı, Alexandrov+ | (CERN BEATRICE Collab.) |
| BARIELI | 95 | PR D52 4800 | +Csorna, Egyed, Jain+ | (CLEO Collab.) |
| FRARETTI | 95 05C | PR D52 2050 PL B354 486 | +Fu, Nemati, Ross, Skubic+ +Cheung, Cumplet+ | (ENAL E687 Collab.) |
| FRARETTI | 95C | PL B364 127 | +Cheung, Cumalat+ $+$ | (FNAL E687 Collab.) |
| KODAMA | 95 | PL B345 85 | +Ushida Mokhtarani+ | (FNAL E653 Collab.) |
| ALBRECHT | 94 | PL B324 249 | +Ehrlichmann, Hamacher+ | (ARGUS Collab.) |
| ALBRECHT | 94F | PL B340 125 | +Hamacher, Hofmann+ | (ARGUS Collab.) |
| ALBRECHT | 94I | ZPHY C64 375 | +Hamacher, Hofmann+ | (ARGUS Collab.) |
| CINABRO | 94 | PRL 72 1406 | $+ {\sf Henderson, Liu, Saulnier} +$ | (CLEO Collab.) |
| FRABETTI | 94C | PL B321 295 | +Cheung, Cumalat+ | (FNAL E687 Collab.) |
| FRABETTI | 94D | PL B323 459 | +Cheung, Cumalat+ | (FNAL E687 Collab.) |
| FRABETTI | 94G | PL B331 217 | +Cheung, Cumalat+ | (FNAL E687 Collab.) |
| | 941 | PR D50 R2953 | +Cneung, Cumalat+ | (FNAL E087 Collab.) |
| KODAMA | 94J 0/ | PL B336 605 | +Cheung, Cumarat+ | (FNAL E007 Collab.) |
| MISHRA | 94 94 | PR D50 R9 | +Brown Cooper+ | (FNAL E033 Collab.) |
| AKERIB | 93 | PRL 71 3070 | +Barish, Chadha, Chan+ | (CLEO Collab.) |
| ALBRECHT | 93D | PL B308 435 | +Ehrlichmann, Hamacher+ | (ARGUS Collab.) |
| ANJOS | 93 | PR D48 56 | +Appel, Bean, Bracker+ | (FNÀL E691 Collab.) |
| BEAN | 93C | PL B317 647 | +Gronberg, Kutschke, Menary+ | ` (CLEO Collab.) |
| FRABETTI | 93I | PL B315 203 | +Bogart, Cheung, Culy+ | (FNAL E687 Collab.) |
| KODAMA | 93B | PL B313 260 | +Ushida, Mokhtarani+ | (FNAL E653 Collab.) |
| PROCARIO | 93B | PR D48 4007 | +Yang, Akerib, Barish+ | (CLEO Collab.) |
| SELEN | 93 | PRL /1 19/3 | +Sadoff, Ammar, Ball+ | (CLEU Collab.) |
| | 92 02P | 7PHV (56 7 | +Alexandrov, Antinon+ | (ARCUS Collab.) |
| ANIOS | 92B | PR D46 R1 | +Appel Bean Bracker+ | (FNAL F691 Collab.) |
| ANJOS | 92C | PR D46 1941 | +Appel, Bean, Bracker+ | (FNAL E691 Collab.) |
| BARLAG | 92C | ZPHY C55 383 | +Becker, Bozek, Boehringer+ | (ACCMOR Collab.) |
| Also | 90D | ZPHY C48 29 | Barlag, Becker, Boehringer, Bo | sman+ (ACCMOR Collab.) |
| COFFMAN | 92B | PR D45 2196 | +DeJongh, Dubois, Eigen+ | `(Mark III Collab.) |
| Also | 90 | PRL 64 2615 | Adler, Blaylock, Bolton+ | (Mark III Collab.) |
| FRABETTI | 92 | PL B281 167 | +Bogart, Cheung, Culy+ | (FNAL E687 Collab.) |
| FRABETTI | 92B | PL B286 195 | +Bogart, Cheung, Culy+ | (FNAL E687 Collab.) |
| ALVAREZ | 91B | ZPHY C50 11 | +Barate, Bloch, Bonamy+ | (CERN NA14/2 Collab.) |
| | 91 01 | PR D44 3303 | +Daringer, Coppage, Davis+ | (CLEO COIIAD.) |
| | 91 01D | PR D44 R3371 | +Appel Bean Bracker+ | (FNAL-TPS Collab.) |
| BAI | 91 | PRL 66 1011 | +Bolton, Brown, Bunnell+ | (Mark III Collab.) |
| COFFMAN | 91 | PL B263 135 | +DeJongh, Dubois, Eigen, Hitlin | + (Mark III Collab.) |
| CRAWFORD | 91B | PR D44 3394 | +Fulton, Gan, Jensen+ | (CLEO Collab.) |
| DECAMP | 91J | PL B266 218 | + Deschizeaux, Goy, Lees + | (ALEPH Collab.) |
| FRABETTI | 91 | PL B263 584 | +Bogart, Cheung, Culy+ | (FNAL E687 Collab.) |
| KINOSHITA | 91 | PR D43 2836 | +Pipkin, Procario, Wilson+ | (CLEO Collab.) |
| KUDAMA | 91 | PRL 66 1819 | +Ushida, Mokhtarani, Paolone+ | (FNAL E653 Collab.) |
| | 90C | 2PHY C40 9 DDI 65 1104 | +Glaeser, Harder, Krueger+ | (AKGUS Collab.) |
| | 90 90 | FRE 03 1104 PRI 65 1521 | +Artuso, Debek, Berkelman+ | (CLEU COIIAD.) |
| AIVARE7 | 900 | 7PHY C47 539 | +Barate Bloch Ronamy+ | (CERN NA14/2 Collab.) |
| ANJOS | 90D | PR D42 2414 | +Appel, Bean, Bracker+ | (FNAL E691 Collab.) |
| BARLAG | 90C | ZPHY C46 563 | +Becker, Boehringer, Bosman+ | (ACCMOR Collab.) |
| ADLER | 89 | PRL 62 1821 | +Becker, Blaylock, Bolton+ | `(Mark III Collab.) |
| | | | | , |

HTTP://PDG.LBL.GOV

Page 46

Created: 6/29/1998 12:22

| ADLER ALBRECHT ANJOS ABACHI ADLER ADLER ALBRECHT ALBRECHT AMENDOLIA ANJOS BORTOLETTO Also | 89C 89D 89F 88 88 88C 88G 88G 88I 88 88C 88 88 88C 88 | PR D40 906 ZPHY C43 181 PRL 62 1587 PL B205 411 PR D37 2023 PRL 60 89 PL B209 380 PL B210 267 EPL 5 407 PRL 60 1239 PR D37 1719 PR D39 1471 erratum | +Bai, Becker, Blaylock, Bolton+ +Boeckmann, Glaeser, Harder+(Mark III Col (ARGUS Col (FNAL E691 Col +Akerlof, Baringer+ +Becker, Blaylock+ +Boeckmann, Glaeser+ +Boeckmann, Glaeser+ +Bagliesi, Batignani+ (ARGUS Col +Appel+ (FNAL E691 Col (ARGUS Col +Col +Coldberg, Horwitz, Mestayer, Moneti+(Mark III Col (Mark III Col (Mark III Col (Mark III Col (ARGUS Col (ARGUS Col (ARGUS Col (ARGUS Col (ARGUS Col (ARGUS Col (CLEO Col | lab.) lab.) lab.) lab.) lab.) lab.) lab.) lab.) lab.) lab.) |
|--|---|--|---|--|
| CUMALAT HAAS RAAB ADAMOVICH ADLER AGUILAR AIso AGUILAR AIso AGUILAR AIso | 88 88 88 87 87 87D 88B 87E 88B 87F 88 | PL B210 253 PRL 60 1614 PR D37 2391 EPL 4 887 PL B196 107 PL B193 140 ZPHY C40 321 ZPHY C36 551 ZPHY C36 559 ZPHY C38 520 erratum | +Shipbaugh, Binkley+ (E-400 Col +Hempstead, Jensen+ (CLEO Col +Anjos, Appel, Bracker+ (FNAL E691 Col +Alexandrov, Bolta+ (Photon Emulsion Col +Becker, Blaylock, Bolton+ (Mark III Col Aguilar-Benitez, Allison+ (LEBC-EHS Col Aguilar-Benitez, Allison, Bailly+ (LEBC-EHS Col Aguilar-Benitez, Allison, Bailly+ (LEBC-EHS Col Aguilar-Benitez, Allison, Bailly+ (LEBC-EHS Col Aguilar-Benitez, Allison, Bailly+ (LEBC-EHS Col | lab.) lab.) lab.) lab.) lab.) lab.) lab.) lab.) lab.) |
| ALBRECHT ALBRECHT BARLAG BECKER Also | 87E 87K 87B 87C 87D 87 | ZPHY C33 359 PL B199 447 ZPHY C37 17 PL B193 147 PL B198 590 erratum PL B101 318 | +Binder, Boeckmann, Glaser+ +Andam, Binder, Boeckmann+ +Becker, Boehringer, Bosman+ +Blaylock, Bolton, Brown+ Becker, Blaylock, Bolton+ +Mestaver, Panvini, Word+ (CLEO, Col | lab.) lab.) lab.) lab.) lab.) lab.) |
| PALKA RILES ABACHI ABE BAILEY | 87 87 86D 86 86 | PL B189 238 PR D35 2914 PL B182 101 PR D33 1 ZPHY C30 51 | +Bailey, Becker, Belau+ (ACCMOR Col +Dorfan, Abrams, Amidei+ (Mark II Col +Akerlof, Baringer, Ballam+ (HRS Col + (SLAC Hybrid Facility Photon Col +Belau, Boehringer, Bosman+ (ACCMOR Col | lab.) lab.) lab.) lab.) lab.) |
| GLADNEY LOUIS USHIDA ALBRECHT ALBRECHT | 86 86 86 86B 85B 85F | PRL 56 1893 PR D34 2601 PRL 56 1027 PRL 56 1771 PL 158B 525 PL 150B 235 | +Berkelman, Blucher, Cassel+ (CLEO Col +Jaros, Ong, Barklow+ (Mark II Col +Adolphsen, Alexander+ (PRIN, CHIC, +Kondo+ (AICH, FNAL, KOBE, SEOU, MCC +Binder, Harder, Philipp+ (ARGUS Col +Binder, Harder, Philipp+ (ARGUS Col | lab.) lab.) ISU) GI+) lab.) lab.) |
| AUBERT BAILEY BALTRUSAIT BALTRUSAIT BENVENUTI YAMAMOTO | 85 85 85B 85E 85 85 | PL 155B 461 ZPHY C28 357 PRL 54 1976 PRL 55 150 PL 158B 531 PRL 522 | +Bassompierre, Becks, Benchouk+ +Belau, Boehringer, Bosman+ Baltrusaitis, Becker, Blaylock, Brown+ +Bollini, Bruni, Camporesi+ (Baltrusaitis, Becker, Blaylock, Brown+ +Bollini, Bruni, Camporesi+ (BC Col (Mark III Col (BCDMS Col (Mark III Col (BCDMS Col | lab.) lab.) lab.) lab.) lab.) |
| ADAMOVICH ALTHOFF DERRICK PARTRIDGE SUMMERS | 84B 84B 84 84 84 84 | PL 140B 123 PL 138B 317 PRL 53 1971 Thesis CALT-68-1150 PRL 52 410 | +Alexandrov, Bravo+ +Braunschweig, Kirschfink+ +Fernandez, Fries, Hyman+ (Crystal Ball Col + (UCSB, CARL, COLO, FNAL, TNTO, OKLA, CN | lab.) lab.) lab.) lab.) lab.) IRC) |
| BAILEY BODEK FIORINO SCHINDLER TRILLING ASTON | 83B 82 81 81 81 80F | PL 132B 237 PL 113B 82 LNC 30 166 PR D24 78 PRPL 75 57 PL 94B 113 | +Bardsley, Becker, Blanar+ (ACCMOR Col +Breedon+ (ROCH, CIT, CHIC, FNAL, ST + (Photon-Emulsion and Omega-Photon Col +Alam, Boyarski, Breidenbach+ (Mark II Col (LBL, U + (BONN, CERN, FPOL GLAS LANC MCH | lab.) AN) lab.) lab.) ICB) J IS+) |
| AVERY SCHINDLER ZHOLENTZ Also | 80 80 80 81 | PRL 44 1309 PR D21 2716 PL 96B 214 SJNP 34 814 | +Wiss, Butler, Gladding+ (ILL, FNAL, CC +Siegrist, Alam, Boyarski+ (Mark II Col +Kurdadze, Lelchuk, Mishnev+ (NO Zholentz, Kurdadze, Lelchuk+ (NO | iab.) VO) |

Translated from YAF 34 1471.

| ABRAMS ATIYA BALTAY VUILLEMIN FELDMAN GOLDHABER PERUZZI PICCOLO RAPIDIS GOLDHABER | 79D 79 78C 78 77B 77 77 77 77 77 | PRL 43 481 PRL 43 414 PRL 41 73 PRL 41 1149 PRL 38 1313 PL 69B 503 PRL 39 1301 PL 70B 260 PRL 39 526 PRL 37 255 OTHEI | +Alam, Blocker, Boyarski+ +Holmes, Knapp, Lee+ +Caroumbalis, French, Hibbs, Hylton+ +Feldman, Feller+ +Peruzzi, Piccolo, Abrams, Alam+ +Wiss, Abrams, Alam+ +Piccolo, Feldman+ +Peruzzi, Luth, Nguyen, Wiss, Abrams+ +Gobbi, Luke, Barbaro-Galtieri+ +Pierre, Abrams, Alam+ R RELATED PAPERS | (Mark II Collab.) (COLU, ILL, FNAL) (COLU, BNL) (Mark I Collab.) (Mark I Collab.) (Mark I Collab.) (Mark I Collab.) (Mark I Collab.) (Mark I Collab.) (Mark I Collab.) |
|--|---|---|---|---|
| RICHMAN | 95 | RMP 67 893 | +Burchat | (UCSB. STAN) |
| ROSNER | 95 | CNPP 21 369 | | (CHIC) |

HTTP://PDG.LBL.GOV