ho(145)

$$I^{G}(J^{PC}) = 1^{+}(1^{--})$$

See our mini-review under the $\rho(1700)$.

ρ(1450) MASS

| VALUE | (MeV) |
|-------|-------|
|-------|-------|

DOCUMENT ID

1465±25 OUR ESTIMATE This is only an educated guess; the error given is larger than the error on the average of the published values.

$\eta \rho^0$ MODE

| VALUE (MeV) | DOCUMENT ID | TECN | COMMENT |
|--|----------------------------|---------------|---|
| $\bullet \bullet \bullet$ We do not use the fo | ollowing data for average | es, fits, lim | its, etc. • • • |
| 1497 ± 14 | 1 AKHMETSHIN 01 | LB CMD2 | $e^+e^- \rightarrow \eta \gamma$ |
| 1421 ± 15 | ² AKHMETSHIN 00 | DD CMD2 | $e^+e^- ightarrow \eta \pi^+\pi^-$ |
| 1470 ± 20 | ANTONELLI 88 | 3 DM2 | $e^+e^- ightarrow \eta \pi^+\pi^-$ |
| 1446 ± 10 | FUKUI 88 | B SPEC | $8.95 \ \pi^- p \rightarrow \eta \pi^+ \pi^- n$ |
| | | | |

¹Using the data of AKHMETSHIN 01B on $e^+e^- \rightarrow \eta\gamma$, AKHMETSHIN 00D and ANTONELLI 88 on $e^+e^- \rightarrow \eta \pi^+\pi^-$.

² Using the data of ANTONELLI 88, DOLINSKY 91, and AKHMETSHIN 00D. The energyindependent width of the $\rho(1450)$ and $\rho(1700)$ mesons assumed.

$\omega\pi$ MODE

| VALUE (MeV) | EVTS | DOCUMENT ID | | TECN | COMMENT |
|--|--------------|-------------------------|-------------|-----------|--|
| • • • We do not use the | ne following | data for averages | , fits, | limits, e | tc. • • • |
| $1582 \pm 17 \pm 25$ | 2382 | ³ AKHMETSHIN | 03 в | CMD2 | $e^+e \rightarrow \pi^0 \pi^0 \gamma$ |
| $1349 \!\pm\! 25 \!+\! {10 \atop -\! 5}$ | 341 | ⁴ ALEXANDER | 01 B | CLE2 | $B \rightarrow D^{(*)} \omega \pi^{-}$ |
| 1523 ± 10 | | ⁵ EDWARDS | 00A | CLE2 | $\tau^- \rightarrow \omega \pi^- \nu_{\tau}$ |
| 1463 ± 25 | | ⁶ CLEGG | 94 | RVUE | |
| 1250 | | ⁷ ASTON | 80 C | OMEG | 20–70 $\gamma p \rightarrow \omega \pi^0 p$ |
| $1290\!\pm\!40$ | | ⁷ BARBER | 80C | SPEC | $3-5 \gamma p \rightarrow \omega \pi^0 p$ |
| _ | | | | | |

³ Using the data of AKHMETSHIN 03B and BISELLO 91B assuming the $\omega \pi^0$ and $\pi^+ \pi^-$ mass dependence of the total width. $\rho(1700)$ mass and width fixed at 1700 MeV and 240 MeV, respectively.

⁴ Using Breit-Wigner parameterization of the ho(1450) and assuming the $\omega \pi^-$ mass dependence for the total width.

⁵ Mass-independent width parameterization. $\rho(1700)$ mass and width fixed at 1700 MeV and 235 MeV respectively.

⁶ Using data from BISELLO 91B, DOLINSKY 86 and ALBRECHT 87L. ⁷ Not separated from $b_1(1235)$, not pure $J^P = 1^-$ effect.

4π MODE

| VALUE (MeV) | DOCUMENT ID | | TECN | COMMENT | | | |
|--|------------------------|-------------|-------------------------|--|--|--|--|
| \bullet \bullet We do not use the follow | ing data for aver | ages, | fits, limi [.] | ts, etc. ● ● ● | | | |
| 1435±40 | ABELE | 01 B | CBAR | $0.0 \ \overline{p} n \rightarrow 2\pi^{-} 2\pi^{0} \pi^{+}$ | | | |
| 1350 ± 50 | ACHASOV | 97 | RVUE | $e^+e^- ightarrow 2(\pi^+\pi^-)$ | | | |
| 1449± 4 | ⁸ ARMSTRONG | 89E | OMEG | $300 \ pp \rightarrow \ pp2(\pi^+\pi^-)$ | | | |
| ⁸ Not clear whether this observation has $I = 1$ or 0 | | | | | | | |

Not clear whether this observation has I=1 or 0.

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|--------------------|--------|
|--------------------|--------|

| $\pi\pi$ | IODE | | | | | | |
|-----------------|----------------|----------|---------|--------------------------|-------------|-------------|--|
| VALUE | (MeV) | | EVTS | DOCUMENT ID | | TECN | COMMENT |
| • • • | We do | o not ι | ise the | following data for ave | erages | , fits, lin | nits, etc. • • • |
| 1446 | \pm 7 | ± 28 | 5.4M | ^{9,10} FUJIKAWA | 08 | BELL | $\tau^- \rightarrow \pi^- \pi^0 \nu_{\tau}$ |
| 1328 | ± 15 | | | ¹¹ SCHAEL | 0 5C | ALEP | $\tau^- \rightarrow \pi^- \pi^0 \nu_{\tau}$ |
| 1406 | ± 15 | | 87k | ^{9,12} ANDERSON | 00A | CLE2 | $\tau^- \rightarrow \pi^- \pi^0 \nu_{\tau}$ |
| ~ 136 | 8 | | | ¹³ ABELE | 99 C | CBAR | $0.0 \ \overline{p} d \rightarrow \pi^+ \pi^- \pi^- p$ |
| 1348 | ± 33 | | | BERTIN | 98 | OBLX | 0.05–0.405 $\overline{n}p \rightarrow 2\pi^+\pi^-$ |
| 1411 | ± 14 | | | ¹⁴ ABELE | 97 | CBAR | $\overline{p}n \rightarrow \pi^{-}\pi^{0}\pi^{0}$ |
| 1370 | $^{+90}_{-70}$ | | | ACHASOV | 97 | RVUE | $e^+e^- \rightarrow \pi^+\pi^-$ |
| 1359 | ± 40 | | | ¹² BERTIN | 97 C | OBLX | $0.0 \ \overline{p} p \rightarrow \pi^+ \pi^- \pi^0$ |
| 1282 | ± 37 | | | BERTIN | 97 D | OBLX | $0.05 \ \overline{p} p \rightarrow 2\pi^+ 2\pi^-$ |
| 1424 | ± 25 | | | BISELLO | 89 | DM2 | $e^+e^- \rightarrow \pi^+\pi^-$ |
| 1265. | 5 ± 75.3 | 3 | | DUBNICKA | 89 | RVUE | $e^+e^- \rightarrow \pi^+\pi^-$ |
| 1292 | ± 17 | | | ¹⁵ KURDADZE | 83 | OLYA | 0.64–1.4 $e^+e^- \to \pi^+\pi^-$ |
| ⁹ Fı | om the | e GOU | NARIS | 68 parametrization o | of the | pion for | m factor. |

 $|F_{\pi}(0)|^2$ fixed to 1.

 11 From the combined fit of the τ^- data from ANDERSON 00A and SCHAEL 05C and e^+e^- data from the compilation of BARKOV 85, AKHMETSHIN 04, and ALOISIO 05. ho(1700) mass and width fixed at 1713 MeV and 235 MeV, respectively. Supersedes BARATE 97M. $^{12}\,\rho(1700)$ mass and width fixed at 1700 MeV and 235 MeV, respectively.

 $^{13}\rho(1700)$ mass and width fixed at 1780 MeV and 275 MeV respectively.

¹⁴ T-matrix pole.

 15 Using for ho(1700) mass and width 1600 \pm 20 and 300 \pm 10 MeV respectively.

KK MODE

| VALUE (MeV) | EVTS | DOCUMENT IL |) | TECN | CHG | COMMENT | |
|---|---------|---------------------|-------------|-------------|---------|------------------------------------|-------------------------------|
| • • • We do not | use the | following data for | average | s, fits, li | mits, e | tc. ● ● ● | |
| 1422.8 ± 6.5 | 27k | ¹⁶ ABELE | 99 D | CBAR | ± | $0.0 \ \overline{p} p \rightarrow$ | ${\cal K}^+ {\cal K}^- \pi^0$ |
| 16 K-matrix pole. Isospin not determined, could be $\omega(1420).$ | | | | | | | |
| | | | | | | | |

$K\overline{K}^*(892) + c.c.$ MODE

| VALUE (MeV) | DOCUMENT ID | | TECN | COMMENT | |
|---|---------------------|---------|-----------|---------------------------|------------------------------|
| \bullet \bullet We do not use the following | lowing data for ave | erages, | fits, lim | its, etc. • • • | |
| $1505 \pm 19 \pm 7$ | AUBERT | 08s | BABR | 10.6 $e^+e^- \rightarrow$ | $K\overline{K}^*(892)\gamma$ |

ρ(1450) WIDTH

VALUE (MeV)

DOCUMENT ID

400±60 OUR ESTIMATE This is only an educated guess; the error given is larger than the error on the average of the published values.

| $\eta \rho^0$ MODE | | |
|------------------------|--------------------------------|--|
| VALUE (MeV) | DOCUMENT ID | TECN COMMENT |
| • • • We do not use th | e following data for averages, | s, fits, limits, etc. • • • |
| 226±44 | ¹⁷ AKHMETSHIN 01B | CMD2 $e^+e^- \rightarrow \eta\gamma$ |
| 211 ± 31 | ¹⁸ AKHMETSHIN 00D | CMD2 $e^+e^- \rightarrow \eta \pi^+\pi^-$ |
| 230±30 | ANTONELLI 88 | DM2 $e^+e^- \rightarrow \eta \pi^+\pi^-$ |
| $60\!\pm\!15$ | FUKUI 88 | SPEC 8.95 $\pi^- p \rightarrow \eta \pi^+ \pi^- n$ |
| 17 | | |

 17 Using the data of AKHMETSHIN 01B on $e^+e^- o \eta \gamma$, AKHMETSHIN 00D and ANTONELLI 88 on $e^+e^- \rightarrow \eta \pi^+\pi^-$.

¹⁸ Using the data of ANTONELLI 88, DOLINSKY 91, and AKHMETSHIN 00D. The energyindependent width of the $\rho(1450)$ and $\rho(1700)$ mesons assumed.

| $\omega \pi$ MODE VALUE (MeV) | EVTS | DOCUMENT ID | | TECN | COMMENT |
|----------------------------------|-------------|--------------------------|-------------|-----------|--|
| • • • We do not use the | e following | g data for averages | , fits, | limits, e | tc. • • • |
| $429{\pm}42{\pm}10$ | 2382 | ¹⁹ AKHMETSHIN | 03 B | CMD2 | $e^+e \rightarrow \pi^0 \pi^0 \gamma$ |
| $547\pm\ 86^{+46}_{-45}$ | 341 | ²⁰ ALEXANDER | 01 B | CLE2 | $B \rightarrow D^{(*)} \omega \pi^-$ |
| 400± 35 | | ²¹ EDWARDS | 00A | CLE2 | $\tau^- \rightarrow \omega \pi^- \nu_{\tau}$ |
| $311\pm$ 62 | | ²² CLEGG | 94 | RVUE | |
| 300 | | ²³ ASTON | 80C | OMEG | 20–70 $\gamma p \rightarrow \omega \pi^0 p$ |
| $320\!\pm\!100$ | | ²³ BARBER | 80C | SPEC | 3–5 $\gamma p \rightarrow \omega \pi^0 p$ |

¹⁹ Using the data of AKHMETSHIN 03B and BISELLO 91B assuming the $\omega \pi^0$ and $\pi^+ \pi^-$ mass dependence of the total width. $\rho(1700)$ mass and width fixed at 1700 MeV and 240 MeV, respectively.

 20 Using Breit-Wigner parameterization of the $\rho(1450)$ and assuming the $\omega\,\pi^-$ mass dependence for the total width.

²¹ Mass-independent width parameterization. $\rho(1700)$ mass and width fixed at 1700 MeV and 235 MeV respectively.

²² Using data from BISELLO 91B, DOLINSKY 86 and ALBRECHT 87L. ²³ Not separated from $b_1(1235)$, not pure $J^P = 1^-$ effect.

4π MODE

| VALUE (MeV) | DOCUMENT ID | | TECN | COMMENT | |
|---|---------------------|-------------|-----------|------------------------------------|---------------------------|
| \bullet \bullet We do not use the following | g data for averages | s, fits, | limits, e | etc. • • • | |
| 325 ± 100 | ABELE | 01 B | CBAR | $0.0 \ \overline{p} n \rightarrow$ | $2\pi^{-}2\pi^{0}\pi^{+}$ |

$\pi\pi$ MODE

| VALUE (MeV) | EVTS | DOCUMENT ID | | TECN | COMMENT |
|-----------------------------|---------|---------------------------|-------------|-------------|--|
| • • • We do not | use the | following data for av | erage | s, fits, li | mits, etc. • • • |
| $434 \!\pm\! 16 \!\pm\! 60$ | 5.4M | ^{24,25} FUJIKAWA | 08 | BELL | $\tau^- \rightarrow \pi^- \pi^0 \nu_{\tau}$ |
| $468\!\pm\!41$ | | ²⁶ SCHAEL | 05 C | ALEP | $\tau^- \rightarrow \pi^- \pi^0 \nu_{\tau}$ |
| $455\!\pm\!41$ | 87k | ^{24,27} ANDERSON | 00A | CLE2 | $\tau^- \rightarrow \pi^- \pi^0 \nu_{\tau}$ |
| ~ 374 | | ²⁸ ABELE | 99 C | CBAR | $0.0 \ \overline{p} d \rightarrow \pi^+ \pi^- \pi^- p$ |
| $275\!\pm\!10$ | | BERTIN | 98 | OBLX | 0.05–0.405 $\overline{n}p \rightarrow \pi^+\pi^+\pi^-$ |
| $343\!\pm\!20$ | | ²⁹ ABELE | 97 | CBAR | $\overline{p}n \rightarrow \pi^{-}\pi^{0}\pi^{0}$ |
| 310 ± 40 | | ²⁷ BERTIN | 97 C | OBLX | $0.0 \ \overline{p} p \rightarrow \ \pi^+ \pi^- \pi^0$ |
| $236\!\pm\!36$ | | BERTIN | 97 D | OBLX | $0.05 \ \overline{p} p \rightarrow 2\pi^+ 2\pi^-$ |
| $269\!\pm\!31$ | | BISELLO | 89 | DM2 | $e^+e^- ightarrow \pi^+\pi^-$ |
| $391\!\pm\!70$ | | DUBNICKA | 89 | RVUE | $e^+e^- \rightarrow \pi^+\pi^-$ |
| $218\!\pm\!46$ | | ³⁰ KURDADZE | 83 | OLYA | 0.64–1.4 $e^+e^- ightarrow \pi^+\pi^-$ |
| | | | | | |

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 $^{\rm 24}\,{\rm From}$ the GOUNARIS 68 parametrization of the pion form factor.

 $^{25}|F_{\pi}(\mathbf{0})|^2$ fixed to 1.

²⁶ From the combined fit of the τ^- data from ANDERSON 00A and SCHAEL 05C and e^+e^- data from the compilation of BARKOV 85, AKHMETSHIN 04, and ALOISIO 05. $\rho(1700)$ mass and width fixed at 1713 MeV and 235 MeV, respectively. Supersedes BARATE 97M. 27 $\rho(1700)$ mass and width fixed at 1700 MeV and 235 MeV, respectively. 28 $\rho(1700)$ mass and width fixed at 1780 MeV and 275 MeV respectively.

²⁹ T-matrix pole.

 30 Using for $\rho(1700)$ mass and width 1600 \pm 20 and 300 \pm 10 MeV respectively.

KK MODE

| VALUE (MeV) | EVTS | DOCUMENT | ID | TECN | CHG | COMMENT | |
|---------------------------|---------------|---------------------|-------------|----------------|---------|------------------------------------|-----------------|
| • • • We do no | t use the fo | llowing data fo | or average | s, fits, li | mits, e | tc. • • • | |
| 146.5 ± 10.5 | 27k | ³¹ ABELE | 99 D | CBAR | ± | $0.0 \ \overline{p} p \rightarrow$ | $K^+ K^- \pi^0$ |
| ³¹ K-matrix po | le. Isospin r | not determined | , could be | ω (1420 |)). | | |

$K\overline{K}^*(892)$ + c.c. MODE

| VALUE (MeV) | DOCUMENT ID | | TECN | COMMENT | |
|-------------------------------|-------------------|-------------|-----------|---------------------------|-------------------|
| • • • We do not use the follo | wing data for ave | erages, | fits, lim | its, etc. • • • | |
| $418 \pm 25 \pm 4$ | AUBERT | 0 8S | BABR | 10.6 $e^+e^- \rightarrow$ | <i>ΚK</i> *(892)γ |

ρ (1450) DECAY MODES

| | Mode | Fraction (Γ_i/Γ) |
|-----------------|--------------------------------|------------------------------|
| Γ_1 | $\pi\pi$ | seen |
| Г2 | 4π | seen |
| Γ ₃ | $\omega \pi$ | |
| Γ ₄ | $a_1(1260)\pi$ | |
| Γ ₅ | $h_1(1170)\pi$ | |
| Г ₆ | $\pi(1300)\pi$ | |
| Γ ₇ | ho ho | |
| Г ₈ | $ ho(\pi\pi)$ S-wave | |
| Г9 | e^+e^- | seen |
| Γ ₁₀ | ηho | possibly seen |
| Γ_{11} | $a_2(1320)\pi$ | not seen |
| Γ ₁₂ | KK | not seen |
| Γ ₁₃ | $K\overline{K}^{*}(892)+$ c.c. | possibly seen |
| Γ_{14} | $\eta\gamma$ | possibly seen |

$\rho(1450) \Gamma(i)\Gamma(e^+e^-)/\Gamma(total)$

| $\Gamma(\pi\pi) \times \Gamma(e^+e^-)/\Gamma_{\text{total}}$ | | | | | | |
|--|------------------------|--------|-----------|---------------------------------|--------------|--|
| VALUE (keV) | DOCUMENT ID | | TECN | COMMENT | | |
| $\bullet \bullet \bullet$ We do not use the fol | lowing data for ave | rages, | fits, lin | nits, etc. • • • | | |
| 0.12 | ³² DIEKMAN | 88 | RVUE | $e^+e^- \rightarrow \pi^+\pi^-$ | | |
| $0.027 \substack{+0.015 \\ -0.010}$ | ³³ KURDADZE | 83 | OLYA | 0.64–1.4 $e^+e^- \rightarrow$ | $\pi^+\pi^-$ | |
| HTTP://PDG.LBL.GOV | / Page | 4 | C | Created: 7/30/20 | 10 16:47 | |

Citation: K. Nakamura *et al.* (Particle Data Group), JPG **37**, 075021 (2010) (URL: http://pdg.lbl.gov)

| $I(\eta \rho) \times I(e'e)/I_{tota}$ | I | | | | Г ₁₀ Г ₉ /Г |
|--|--|---|--|---|---|
| VALUE (eV) | DOCUMENT IE |) | <u>TECN</u> | COMMENT | |
| • • • We do not use the follo | wing data for averag | ges, fits, | limits, e | etc. • • • | |
| 74±20 91±19 | ³⁴ AKHMETSH ANTONELLI | IN 00D 88 | CMD2 DM2 | $e^+e^- \rightarrow e^+e^- \rightarrow$ | $\eta \pi^+ \pi^-$ $\eta \pi^+ \pi^-$ |
| $\Gamma(\eta\gamma)$ × $\Gamma(e^+e^-)/\Gamma_{\rm tota}$ | h | | | | Г ₁₄ Г9/Г |
| VALUE (eV) | DOCUMENT ID | TEC | <u>CN</u> <u>CO</u> | MMENT | |
| • • We do not use the follo | wing data for averag | ges, fits, | limits, e | etc. • • • | |
| ${<}16.4$ $2.2{\pm}0.5{\pm}0.3$ | ³⁵ AKHMETSHIN 0 ³⁶ AKHMETSHIN 0 | 95 CM 918 CM | 1D2 0.6 1D2 e ⁺ | $\begin{array}{ccc} 0\text{-}1.38 & e^+ \\ e^- \rightarrow & \eta \gamma \end{array}$ | $e^- \rightarrow \eta \gamma$ |
| $\Gamma(K\overline{K}^*(892)+c.c.) \times \Gamma$ | $(e^+e^-)/\Gamma_{total}$ | | | | Г ₁₃ Г9/Г |
| VALUE (eV) | DOCUMENT ID | TEC | <u>COM</u> | IMENT | |
| • • We do not use the follo | wing data for averag | ges, fits, | limits, e | etc. • • • | |
| $127 \pm 15 \pm 6$ | AUBERT 08 | BS BAE | 3R 10.6 | $e^+e^- \rightarrow$ | $K\overline{K}^*(892)\gamma$ |
| ³⁵ From 2γ decay mode of width. Recalculated by us ³⁶ Using the data of AKHM | η using 1465 MeV a . IETSHIN 01B on e^{-1} | and 310 + _e |) MeV for $\eta \gamma$, | or the $ ho(14)$ | 50) mass and 6HIN 00D and |
| ANTONELLI 88 on e ' e | $\rightarrow \eta \pi^+ \pi^-$. Reca | alculated | d by us ι | ising width | of 226 MeV. |
| ANTONELLI 88 on e ' e ρ(| $ \rightarrow \eta \pi^+ \pi^-$. Reca 1450) BRANCHIN | NG RA | d by us ι TIOS | ısing width | of 226 MeV. |
| | $^{-} \rightarrow \eta \pi^{+} \pi^{-}$. Reca 1450) BRANCHIN | NG RA | TIOS | ising width | of 226 MeV. Γ₁/Γ₂ |
| | $^{-} \rightarrow \eta \pi^{+} \pi^{-}$. Reca 1450) BRANCHIN <u>DOCUMENT IL</u> | NG RA | TIOS | <u>COMMENT</u> | of 226 MeV. Γ <mark>1/Γ2</mark> |
| ANTONELLI 88 on $e^{r} e^{r}$ $\rho(\Gamma(\pi \pi)/\Gamma(4\pi))$ <u>VALUE</u> ••• We do not use the follo | $^{-} \rightarrow \eta \pi^{+} \pi^{-}$. Reca 1450) BRANCHIN <u>DOCUMENT IL</u> wing data for averag | NG RA | TIOS | $\frac{COMMENT}{COMMENT}$ | of 226 MeV. Γ₁/Γ₂ |
| ANTONELLI 88 on e^+e^- $\rho(\Gamma(\pi \pi)/\Gamma(4\pi))$ <u>VALUE</u> ••• We do not use the follo 0.37 \pm 0.10 | $^{-} \rightarrow \eta \pi^{+} \pi^{-}$. Reca 1450) BRANCHIN <u>DOCUMENT IE</u> wing data for averag 37,38 ABELE | NG RA Ses, fits, 01B | TIOS <u>TECN</u> limits, e CBAR | $\frac{COMMENT}{2}$ etc. • • • $0.0 \ \overline{p} \ n \rightarrow 0$ | of 226 MeV. Γ₁/Γ₂ 5π |
| ANTONELLI 88 on e^+e^- $\rho(\Gamma(\pi \pi)/\Gamma(4\pi))$ <u>VALUE</u> ••• We do not use the follo 0.37±0.10 $\Gamma(\omega \pi)/\Gamma_{total}$ <u>VALUE</u> | $^{-} \rightarrow \eta \pi^{+} \pi^{-}$. Reca 1450) BRANCHIN <u>DOCUMENT IC</u> wing data for averag 37,38 ABELE | NG RA o ges, fits, 01B | TIOS <u>TECN</u> limits, e CBAR | $\frac{COMMENT}{0.0 \ \overline{p} \ n} \rightarrow$ | of 226 MeV. Γ <mark>1/Γ2</mark> ^{5π} Γ 3/Γ |
| ANTONELLI 88 on e^+e^- $\rho(\Gamma(\pi\pi)/\Gamma(4\pi))$ <u>VALUE</u> ••• We do not use the follo 0.37±0.10 $\Gamma(\omega\pi)/\Gamma_{total}$ <u>VALUE</u> ••• We do not use the follo | $angle \rightarrow \eta \pi^+ \pi^-$. Reca 1450) BRANCHIN <u>DOCUMENT IE</u> wing data for averag 37,38 ABELE <u>DOCUMENT IE</u> wing data for averag | NG RA Ses, fits, 01B 0 ces, fits, | TIOS <u>TECN</u> limits, e CBAR <u>TECN</u> limits, e | COMMENT etc. ● ● $0.0 \overline{p} n \rightarrow$ | of 226 MeV. Γ1/Γ2 ^{5π} Γ3/Γ |
| ANTONELLI 88 on e^+e^- $\rho(\Gamma(\pi\pi)/\Gamma(4\pi))$ VALUE ••• We do not use the follo 0.37 ± 0.10 $\Gamma(\omega\pi)/\Gamma_{total}$ VALUE ••• We do not use the follo ~ 0.21 | ${}^{-} \rightarrow \eta \pi^{+} \pi^{-}$. Reca 1450) BRANCHIN <u>DOCUMENT IL</u> wing data for averag 37,38 ABELE <u>DOCUMENT IL</u> wing data for averag CLEGG | NG RA o ges, fits, 01B ges, fits, 94 | TIOS <u>TECN</u> limits, e CBAR <u>TECN</u> limits, e RVUE | $\frac{COMMENT}{0.0 \ \overline{p} \ n} \rightarrow$ | of 226 MeV. Γ <mark>1/Γ2</mark> ^{5π} Γ ₃ /Γ |
| ANTONELLI 88 on e^+e^- $\rho(\Gamma(\pi \pi)/\Gamma(4\pi))$ <u>VALUE</u> ••• We do not use the follo 0.37 ± 0.10 $\Gamma(\omega \pi)/\Gamma_{total}$ <u>VALUE</u> ••• We do not use the follo ~ 0.21 | ${}^{-} \rightarrow \eta \pi^{+} \pi^{-}$. Reca 1450) BRANCHIN wing data for averag 37,38 ABELE <u>DOCUMENT IL</u> wing data for averag CLEGG | NG RA NG RA 2 2 3 3 3 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 | TIOS <u>TECN</u> limits, e CBAR <u>TECN</u> limits, e RVUE | $\frac{COMMENT}{2}$ etc. • • • $0.0 \ \overline{p} \ n \rightarrow$ | of 226 MeV. Γ1/Γ2 ^{5π} Γ3/Γ |
| ANTONELLI 88 on e^+e^- $\rho(\Gamma(\pi\pi)/\Gamma(4\pi))$ VALUE ••• We do not use the follo 0.37 ± 0.10 $\Gamma(\omega\pi)/\Gamma_{total}$ VALUE ••• We do not use the follo ~ 0.21 $\Gamma(\pi\pi)/\Gamma(\omega\pi)$ | ${}^{-} \rightarrow \eta \pi^{+} \pi^{-}$. Reca 1450) BRANCHIN <u>DOCUMENT IL</u> wing data for averag 37,38 ABELE <u>DOCUMENT IL</u> wing data for averag CLEGG | NG RA NG RA ges, fits, 01B ges, fits, 94 | TIOS <u>TECN</u> limits, e CBAR <u>TECN</u> limits, e RVUE | $\frac{COMMENT}{0.0 \ \overline{p} \ n} \rightarrow$ | of 226 MeV. Γ ₁ /Γ ₂ ^{5π} Γ ₃ /Γ |
| ANTONELLI 88 on e^+e^- $\rho(\Gamma(\pi\pi)/\Gamma(4\pi))$ VALUE ••• We do not use the follo 0.37 ± 0.10 $\Gamma(\omega\pi)/\Gamma_{total}$ VALUE ••• We do not use the follo ~ 0.21 $\Gamma(\pi\pi)/\Gamma(\omega\pi)$ VALUE | $ \rightarrow \eta \pi^+ \pi^-$. Reca 1450) BRANCHIN <u>DOCUMENT IL</u> wing data for averag 37,38 ABELE <u>DOCUMENT IL</u> wing data for averag CLEGG <u>DOCUMENT IL</u> | NG RA NG RA 2 2 3 3 3 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 | TIOS <u>TECN</u> limits, e CBAR <u>TECN</u> limits, e RVUE | $\frac{COMMENT}{2}$ etc. • • • $0.0 \ \overline{p} n \rightarrow$ | of 226 MeV. Γ1/Γ2 ^{5π} Γ3/Γ Γ1/Γ3 |
| ANTONELLI 88 on e^+e^- $\rho(\Gamma(\pi \pi)/\Gamma(4\pi))$ VALUE ••• We do not use the follo 0.37 ± 0.10 $\Gamma(\omega \pi)/\Gamma_{total}$ VALUE ••• We do not use the follo ~ 0.21 $\Gamma(\pi \pi)/\Gamma(\omega \pi)$ VALUE ••• We do not use the follo | $angle \rightarrow \eta \pi^+ \pi^-$. Reca 1450) BRANCHIN <u>DOCUMENT IL</u> wing data for averag 37,38 ABELE <u>DOCUMENT IL</u> wing data for averag CLEGG <u>DOCUMENT IL</u> wing data for averag | Alculated NG RA (1) (ges, fits, 01B (1) (ges, fits, 94 (2) (ges, fits, 0) | TIOS <u>TECN</u> limits, e CBAR <u>TECN</u> limits, e RVUE <u>TECN</u> limits, e | $\frac{COMMENT}{0.0 \ \overline{p} n} \rightarrow$ | of 226 MeV. Γ ₁ /Γ ₂ ^{5π} Γ ₃ /Γ |
| ANTONELLI 88 on e^+e^- $\rho(\Gamma(\pi \pi)/\Gamma(4\pi))$ VALUE ••• We do not use the follo 0.37 ± 0.10 $\Gamma(\omega \pi)/\Gamma_{total}$ VALUE ••• We do not use the follo ~ 0.21 $\Gamma(\pi \pi)/\Gamma(\omega \pi)$ VALUE ••• We do not use the follo ~ 0.32 | ${}^{-} \rightarrow \eta \pi^{+} \pi^{-}$. Reca 1450) BRANCHIN wing data for averag 37,38 ABELE <u>DOCUMENT IL</u> wing data for averag CLEGG <u>DOCUMENT IL</u> wing data for averag CLEGG | Alculated NG RA (1) (ges, fits, 01B (1) (ges, fits, 94 (1) (ges, fits, 94 (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) | TIOS <u>TECN</u> limits, e CBAR <u>TECN</u> limits, e RVUE <u>TECN</u> limits, e RVUE | $\frac{COMMENT}{2}$ etc. • • • etc. • • • | of 226 MeV. Γ1/Γ2 ^{5π} Γ3/Γ Γ1/Γ3 |
| ANTONELLI 88 on e^+e^- $\rho(\Gamma(\pi \pi)/\Gamma(4\pi))$ VALUE ••• We do not use the follo 0.37 ± 0.10 $\Gamma(\omega \pi)/\Gamma_{total}$ VALUE ••• We do not use the follo ~ 0.21 $\Gamma(\pi \pi)/\Gamma(\omega \pi)$ VALUE ••• We do not use the follo ~ 0.32 $\Gamma(\omega \pi)/\Gamma(4\pi)$ | $r \rightarrow \eta \pi^+ \pi^-$. Reca 1450) BRANCHIN <u>DOCUMENT II</u> wing data for averag 37,38 ABELE <u>DOCUMENT II</u> wing data for averag CLEGG <u>DOCUMENT II</u> wing data for averag CLEGG | Alculated NG RA (1) (ges, fits, 01B (2) (ges, fits, 94 (2) (ges, fits, 94 | timits, e <u>TECN</u> limits, e CBAR <u>TECN</u> limits, e RVUE limits, e RVUE | $\frac{COMMENT}{2}$ etc. • • • 0.0 $\overline{p} n \rightarrow$ etc. • • | of 226 MeV. Γ₁/Γ₂ ^{5π} Γ₃/Γ Γ₁/Γ₃ |
| ANTONELLI 88 on e^+e^- $\rho(\Gamma(\pi\pi)/\Gamma(4\pi))$ VALUE ••• We do not use the follo 0.37 ± 0.10 $\Gamma(\omega\pi)/\Gamma_{total}$ VALUE ••• We do not use the follo ~ 0.21 $\Gamma(\pi\pi)/\Gamma(\omega\pi)$ VALUE ••• We do not use the follo ~ 0.32 $\Gamma(\omega\pi)/\Gamma(4\pi)$ VALUE ••• We do not use the follo | $angle \rightarrow \eta \pi^+ \pi^-$. Reca 1450) BRANCHIN <u>DOCUMENT IE</u> wing data for averag 37,38 ABELE <u>DOCUMENT IE</u> wing data for averag CLEGG <u>DOCUMENT IE</u> wing data for averag CLEGG | NG RA NG RA O ges, fits, 01B O ges, fits, 94 O ges, fits, 94 O ges, fits, 94 | TIOS <u>TECN</u> limits, e CBAR <u>TECN</u> limits, e RVUE <u>TECN</u> limits, e RVUE | $\frac{COMMENT}{2}$ etc. • • • etc. • • • | of 226 MeV. Γ1/Γ2 5π Γ3/Γ Γ3/Γ2 |
| ANTONELLI 88 on e^+e^- $\rho(\Gamma(\pi \pi)/\Gamma(4\pi))$ VALUE ••• We do not use the follo 0.37 ± 0.10 $\Gamma(\omega \pi)/\Gamma_{total}$ VALUE ••• We do not use the follo ~ 0.21 $\Gamma(\pi \pi)/\Gamma(\omega \pi)$ VALUE ••• We do not use the follo ~ 0.32 $\Gamma(\omega \pi)/\Gamma(4\pi)$ VALUE ••• We do not use the follo ~ 0.32 | ${}^{-} \rightarrow \eta \pi^{+} \pi^{-}$. Reca 1450) BRANCHIN wing data for averag 37,38 ABELE <u>DOCUMENT IL</u> wing data for averag CLEGG <u>DOCUMENT IL</u> wing data for averag CLEGG | Alculated NG RA Description ges, fits, 01B Description ges, fits, 94 Description ges, fits, 94 Description ges, fits, 02 | TIOS <u>TECN</u> limits, e CBAR <u>TECN</u> limits, e RVUE <u>TECN</u> limits, e RVUE | $\frac{COMMENT}{2}$ etc. • • • etc. • • • etc. • • • | of 226 MeV. Γ₁/Γ₂ ^{5π} Γ₃/Γ Γ₁/Γ₃ |
| ANTONELLI 88 on e^+e^- $\rho(\Gamma(\pi \pi)/\Gamma(4\pi))$ VALUE ••• We do not use the follo 0.37 ± 0.10 $\Gamma(\omega \pi)/\Gamma_{total}$ VALUE ••• We do not use the follo ~ 0.21 $\Gamma(\pi \pi)/\Gamma(\omega \pi)$ VALUE ••• We do not use the follo ~ 0.32 $\Gamma(\omega \pi)/\Gamma(4\pi)$ VALUE ••• We do not use the follo ~ 0.32 | $r \rightarrow \eta \pi^+ \pi^-$. Reca 1450) BRANCHIN <u>DOCUMENT II</u> wing data for averag 37,38 ABELE <u>DOCUMENT II</u> wing data for averag CLEGG <u>DOCUMENT II</u> wing data for averag CLEGG <u>DOCUMENT II</u> wing data for averag CLEGG | Alculated NG RA D ges, fits, 01B D ges, fits, 94 D ges, fits, 94 D ges, fits, 88 | TIOS <u>TECN</u> limits, e CBAR <u>TECN</u> limits, e RVUE <u>TECN</u> limits, e RVUE <u>TECN</u> limits, e RVUE | $\frac{COMMENT}{2}$ etc. • • • etc. • • • etc. • • • | of 226 MeV. Γ1/Γ2 5π Γ3/Γ Γ3/Γ2 |

Citation: K. Nakamura et al. (Particle Data Group), JPG 37, 075021 (2010) (URL: http://pdg.lbl.gov)

| Γ(a₁(1260)π)/Γ(4π) VALUE | DOCUMENT ID | | TECN | <u>COMMENT</u> | Γ ₄ /Γ ₂ |
|---|----------------------------------|-------------|--------------|---|--------------------------------|
| • • • We do not use the following | data for averages | s, fits, | limits, e | etc. • • • | |
| 0.27±0.08 | ³⁷ ABELE | 01 B | CBAR | $0.0 \ \overline{p} n \rightarrow 5\pi$ | τ |
| $\Gamma(h_1(1170)\pi)/\Gamma(4\pi)$ | | | TECN | COMMENT | Γ_5/Γ_2 |
| VALUE | data for averages | fite | limite d | | |
| 0.08±0.04 | ³⁷ ABELE | 01B | CBAR | $0.0 \ \overline{p} n \rightarrow 5n$ | τ |
| $\Gamma(\pi(1300)\pi)/\Gamma(4\pi)$ | | | TF CU | | Γ_6/Γ_2 |
| VALUE | DOCUMENT ID | | <u>TECN</u> | COMMENT | |
| 0.37 ± 0.13 | ³⁷ ABELE | 01B | CBAR | $0.0 \ \overline{p} n \rightarrow 5\pi$ | τ |
| $\Gamma(ho ho)/\Gamma(4\pi)$ | | | | | Γ_7/Γ_2 |
| VALUE | DOCUMENT ID | <i>C</i> . | <u>TECN</u> | <u>COMMENT</u> | |
| • • We do not use the following | data for averages | s, tits, | limits, e | | |
| 0.11 ± 0.05 | S' ABELE | 0 1B | CBAR | $0.0 \ \overline{p} n \rightarrow 57$ | τ |
| $\Gamma(\rho(\pi\pi)_{S-\text{wave}})/\Gamma(4\pi)$ | DOCUMENT ID | | TECN | COMMENT | Γ ₈ /Γ ₂ |
| • • • We do not use the following | data for averages | s. fits. | limits. | etc. • • • | |
| 0.17±0.09 | ³⁷ ABELE | 01 B | CBAR | $0.0 \ \overline{p} n \rightarrow 5 n$ | τ |
| $\Gamma(\eta ho)/\Gamma_{ m total}$ | | | | | Г ₁₀ /Г |
| VALUE | DOCUMENT ID | | <u>TECN</u> | | |
| • • We do not use the following | data for averages | s, fits, | limits, e | etc. • • • | |
| <0.04 | DONNACHIE | 87 B | RVUE | | |
| $\Gamma(\eta ho)/\Gamma(\omega \pi)$ | | | | | Γ_{10}/Γ_3 |
| VALUE | DOCUMENT ID | | TECN | <u>COMMENT</u> | <u> </u> |
| • • • We do not use the following | data for averages | s, fits, | limits, e | etc. • • • | |
| ~ 0.24 >2 | ³⁹ DONNACHIE FUKUI | 91 91 | RVUE SPEC | 8.95 $\pi^- p \rightarrow$ | $\omega \pi^0 n$ |
| $\Gamma(a_2(1320)\pi)/\Gamma_{total}$ | | | | | Г ₁₁ /Г |
| VALUE | DOCUMENT ID | | TECN | COMMENT | |
| • • • We do not use the following | data for averages | s, fits, | limits, e | etc. • • • | |
| not seen | AMELIN | 00 | VES | $37 \pi^{-} p \rightarrow r$ | $\eta \pi^+ \pi^- n$ |
| $\Gamma(K\overline{K})/\Gamma(\omega\pi)$ | | | TECN | | Γ_{12}/Γ_3 |
| • • • We do not use the following | data for average | s fite | limite 4 | | |
| <0.08 | ³⁹ DONNACHIE | 91 | RVUE | | |



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