CHARMED MESONS
($C = \pm 1$)

$D^+ = c\overline{d}$, $D^0 = c\overline{u}$, $\overline{D}^0 = \overline{c}u$, $D^- = \overline{c}d$, similarly for D^*'s

$D^\pm$

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

Mass $m = 1869.3 \pm 0.5$ MeV (S = 1.1)
Mean life $\tau = (1.057 \pm 0.015) \times 10^{-12}$ s
$c\tau = 317$ μm

CP-violation decay-rate asymmetries

$A_{CP}(K^+K^-\pi^\pm) = -0.017 \pm 0.027$
$A_{CP}(K^\pm K^{*0}) = -0.02 \pm 0.05$
$A_{CP}(\phi\pi^\pm) = -0.014 \pm 0.033$
$A_{CP}(\pi^+\pi^-\pi^\pm) = -0.02 \pm 0.04$

$D^+ \to \overline{K}^*(892)^0 \ell^+ \nu_\ell$ form factors

$r_2 = 0.72 \pm 0.09$
$r_v = 1.85 \pm 0.12$
$\Gamma_L/\Gamma_T = 1.23 \pm 0.13$
$\Gamma_+/\Gamma_- = 0.16 \pm 0.04$

D^- modes are charge conjugates of the modes below.

D^+ DECAY MODES	Fraction (Γ_i/Γ)	Scale factor/ Confidence level	p (MeV/c)
Inclusive modes			
e^+ anything	(17.2 ±1.9) %		–
K^- anything	(24.2 ±2.8) %	S=1.4	–
$\overline{K}^0$ anything + K^0 anything	(59 ±7) %		–
K^+ anything	(5.8 ±1.4) %		–
η anything	[nn] < 13 %	CL=90%	–

Leptonic and semileptonic modes

$\mu^+ \nu_\mu$		$< 7.2 \times 10^{-4}$	CL=90%	932
$\overline{K}^0 \ell^+ \nu_\ell$	[oo]	(6.8 ±0.8) %		868
$\overline{K}^0 e^+ \nu_e$		(6.7 ±0.9) %		868
$\overline{K}^0 \mu^+ \nu_\mu$		($7.0\ ^{+3.0}_{-2.0}$) %		865
$K^- \pi^+ e^+ \nu_e$		($4.1\ ^{+0.9}_{-0.7}$) %		863
$\overline{K}^*(892)^0 e^+ \nu_e$ × B($\overline{K}^{*0} \to K^- \pi^+$)		(3.2 ±0.33) %		720
$K^- \pi^+ e^+ \nu_e$ nonresonant		$< 7 \times 10^{-3}$	CL=90%	863
$K^- \pi^+ \mu^+ \nu_\mu$		(3.2 ±0.4) %	S=1.1	851
$\overline{K}^*(892)^0 \mu^+ \nu_\mu$ × B($\overline{K}^{*0} \to K^- \pi^+$)		(2.9 ±0.4) %		715
$K^- \pi^+ \mu^+ \nu_\mu$ nonresonant		(2.7 ±1.1) $\times 10^{-3}$		851
$(\overline{K}^*(892)\pi)^0 e^+ \nu_e$		< 1.2 %	CL=90%	714
$(\overline{K}\pi\pi)^0 e^+ \nu_e$ non-$\overline{K}^*(892)$		$< 9 \times 10^{-3}$	CL=90%	846
$K^- \pi^+ \pi^0 \mu^+ \nu_\mu$		$< 1.4 \times 10^{-3}$	CL=90%	825
$\pi^0 \ell^+ \nu_\ell$	[pp]	(3.1 ±1.5) $\times 10^{-3}$		930

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

$\overline{K}^*(892)^0 \ell^+ \nu_\ell$	[oo]	(4.7 ±0.4) %		720
$\overline{K}^*(892)^0 e^+ \nu_e$		(4.8 ±0.5) %		720
$\overline{K}^*(892)^0 \mu^+ \nu_\mu$		(4.4 ±0.6) %	S=1.1	715
$\rho^0 e^+ \nu_e$		(2.2 ±0.8) $\times 10^{-3}$		776
$\rho^0 \mu^+ \nu_\mu$		(2.7 ±0.7) $\times 10^{-3}$		772
$\phi e^+ \nu_e$		< 2.09 %	CL=90%	657
$\phi \mu^+ \nu_\mu$		< 3.72 %	CL=90%	651
$\eta \ell^+ \nu_\ell$		$< 5 \times 10^{-3}$	CL=90%	–
$\eta'(958) \mu^+ \nu_\mu$		$< 9 \times 10^{-3}$	CL=90%	684

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

$\overline{K}^0\pi^+$		(2.89±0.26) %	S=1.1	862
$K^-\pi^+\pi^+$	[qq]	(9.0 ±0.6) %		845
$\overline{K}^*(892)^0\pi^+$		(1.27±0.13) %		712
$\times$ B($\overline{K}^{*0} \rightarrow K^-\pi^+$)				
$\overline{K}_0^*(1430)^0\pi^+$		(2.3 ±0.3) %		368
$\times$ B($\overline{K}_0^*(1430)^0 \rightarrow K^-\pi^+$)				
$\overline{K}^*(1680)^0\pi^+$		(3.7 ±0.8) $\times 10^{-3}$		65
$\times$ B($\overline{K}^*(1680)^0 \rightarrow K^-\pi^+$)				
$K^-\pi^+\pi^+$ nonresonant		(8.5 ±0.8) %		845
$\overline{K}^0\pi^+\pi^0$	[qq]	(9.7 ±3.0) %	S=1.1	845
$\overline{K}^0\rho^+$		(6.6 ±2.5) %		680
$\overline{K}^*(892)^0\pi^+$		(6.3 ±0.4) $\times 10^{-3}$		712
$\times$ B($\overline{K}^{*0} \rightarrow \overline{K}^0\pi^0$)				
$\overline{K}^0\pi^+\pi^0$ nonresonant		(1.3 ±1.1) %		845
$K^-\pi^+\pi^+\pi^0$	[qq]	(6.4 ±1.1) %		816
$\overline{K}^*(892)^0\rho^+$ total		(1.4 ±0.9) %		423
$\times$ B($\overline{K}^{*0} \rightarrow K^-\pi^+$)				
$\overline{K}_1(1400)^0\pi^+$		(2.2 ±0.6) %		390
$\times$ B($\overline{K}_1(1400)^0 \rightarrow K^-\pi^+\pi^0$)				
$K^-\rho^+\pi^+$ total		(3.1 ±1.1) %		616
$K^-\rho^+\pi^+$ 3-body		(1.1 ±0.4) %		616
$\overline{K}^*(892)^0\pi^+\pi^0$ total		(4.5 ±0.9) %		687
$\times$ B($\overline{K}^{*0} \rightarrow K^-\pi^+$)				
$\overline{K}^*(892)^0\pi^+\pi^0$ 3-body		(2.8 ±0.9) %		687
$\times$ B($\overline{K}^{*0} \rightarrow K^-\pi^+$)				
$K^*(892)^-\pi^+\pi^+$ 3-body		(7 ±3) $\times 10^{-3}$		688
$\times$ B($K^{*-} \rightarrow K^-\pi^0$)				
$K^-\pi^+\pi^+\pi^0$ nonresonant	[rr]	(1.2 ±0.6) %		816
$\overline{K}^0\pi^+\pi^+\pi^-$	[qq]	(7.0 ±0.9) %		814
$\overline{K}^0 a_1(1260)^+$		(4.0 ±0.9) %		328
$\times$ B($a_1(1260)^+ \rightarrow \pi^+\pi^+\pi^-$)				
$\overline{K}_1(1400)^0\pi^+$		(2.2 ±0.6) %		390
$\times$ B($\overline{K}_1(1400)^0 \rightarrow \overline{K}^0\pi^+\pi^-$)				
$K^*(892)^-\pi^+\pi^+$ 3-body		(1.4 ±0.6) %		688
$\times$ B($K^{*-} \rightarrow \overline{K}^0\pi^-$)				
$\overline{K}^0\rho^0\pi^+$ total		(4.2 ±0.9) %		614
$\overline{K}^0\rho^0\pi^+$ 3-body		(5 ±5) $\times 10^{-3}$		614
$\overline{K}^0\pi^+\pi^+\pi^-$ nonresonant		(8 ±4) $\times 10^{-3}$		814

$K^-\pi^+\pi^+\pi^+\pi^-$	[qq]	$(7.2 \pm 1.0) \times 10^{-3}$		772
$\overline{K}^*(892)^0\pi^+\pi^+\pi^-$		$(5.4 \pm 2.3) \times 10^{-3}$		642
$\times$ B($\overline{K}^{*0} \to K^-\pi^+$)				
$\overline{K}^*(892)^0\rho^0\pi^+$		$(1.9 \, ^{+1.1}_{-1.0}) \times 10^{-3}$		242
$\times$ B($\overline{K}^{*0} \to K^-\pi^+$)				
$\overline{K}^*(892)^0\pi^+\pi^+\pi^-$ no-ρ		$(2.9 \pm 1.1) \times 10^{-3}$		642
$\times$ B($\overline{K}^{*0} \to K^-\pi^+$)				
$K^-\rho^0\pi^+\pi^+$		$(3.1 \pm 0.9) \times 10^{-3}$		529
$K^-\pi^+\pi^+\pi^+\pi^-$ nonresonant		$< 2.3 \times 10^{-3}$	CL=90%	772
$K^-\pi^+\pi^+\pi^0\pi^0$		$(2.2 \, ^{+5.0}_{-0.9})$ %		775
$\overline{K}^0\pi^+\pi^+\pi^-\pi^0$		$(5.4 \, ^{+3.0}_{-1.4})$ %		773
$\overline{K}^0\pi^+\pi^+\pi^+\pi^-\pi^-$		$(8 \pm 7) \times 10^{-4}$		714
$K^-\pi^+\pi^+\pi^+\pi^-\pi^0$		$(2.0 \pm 1.8) \times 10^{-3}$		718
$\overline{K}^0\overline{K}^0K^+$		(1.8 ± 0.8) %		545

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

$\overline{K}^0\rho^+$		(6.6 ± 2.5) %		680
$\overline{K}^0a_1(1260)^+$		(8.0 ± 1.7) %		328
$\overline{K}^0a_2(1320)^+$		$< 3 \times 10^{-3}$	CL=90%	199
$\overline{K}^*(892)^0\pi^+$		(1.90 ± 0.19) %		712
$\overline{K}^*(892)^0\rho^+$ total	[rr]	(2.1 ± 1.3) %		423
$\overline{K}^*(892)^0\rho^+$ S-wave	[rr]	(1.6 ± 1.6) %		423
$\overline{K}^*(892)^0\rho^+$ P-wave		$< 1 \times 10^{-3}$	CL=90%	423
$\overline{K}^*(892)^0\rho^+$ D-wave		$(10 \pm 7) \times 10^{-3}$		423
$\overline{K}^*(892)^0\rho^+$ D-wave longitudinal		$< 7 \times 10^{-3}$	CL=90%	423
$\overline{K}_1(1270)^0\pi^+$		$< 7 \times 10^{-3}$	CL=90%	487
$\overline{K}_1(1400)^0\pi^+$		(4.9 ± 1.2) %		390
$\overline{K}^*(1410)^0\pi^+$		$< 7 \times 10^{-3}$	CL=90%	382
$\overline{K}_0^*(1430)^0\pi^+$		(3.7 ± 0.4) %		368
$\overline{K}^*(1680)^0\pi^+$		(1.43 ± 0.30) %		65
$\overline{K}^*(892)^0\pi^+\pi^0$ total		(6.7 ± 1.4) %		687
$\overline{K}^*(892)^0\pi^+\pi^0$ 3-body	[rr]	(4.2 ± 1.4) %		687
$K^*(892)^-\pi^+\pi^+$ 3-body		(2.0 ± 0.9) %		688
$K^-\rho^+\pi^+$ total		(3.1 ± 1.1) %		616
$K^-\rho^+\pi^+$ 3-body		(1.1 ± 0.4) %		616
$\overline{K}^0\rho^0\pi^+$ total		(4.2 ± 0.9) %	CL=90%	614
$\overline{K}^0\rho^0\pi^+$ 3-body		$(5 \pm 5) \times 10^{-3}$		614

$\overline{K}^0 f_0(980)\pi^+$	$<$ 5	$\times 10^{-3}$	CL=90%	461
$\overline{K}^*(892)^0\pi^+\pi^+\pi^-$	(8.1 $\pm$3.4)	$\times 10^{-3}$	S=1.7	642
$\overline{K}^*(892)^0\rho^0\pi^+$	(2.9 $^{+1.7}_{-1.5}$)	$\times 10^{-3}$	S=1.8	242
$\overline{K}^*(892)^0\pi^+\pi^+\pi^-$ no-ρ	(4.3 $\pm$1.7)	$\times 10^{-3}$		642
$K^-\rho^0\pi^+\pi^+$	(3.1 $\pm$0.9)	$\times 10^{-3}$		529

Pionic modes

$\pi^+\pi^0$	(2.5 $\pm$0.7)	$\times 10^{-3}$		925
$\pi^+\pi^+\pi^-$	(3.6 $\pm$0.4)	$\times 10^{-3}$		908
$\rho^0\pi^+$	(1.05$\pm$0.31)	$\times 10^{-3}$		769
$\pi^+\pi^+\pi^-$ nonresonant	(2.2 $\pm$0.4)	$\times 10^{-3}$		908
$\pi^+\pi^+\pi^-\pi^0$	(1.9 $^{+1.5}_{-1.2}$)	%		882
$\eta\pi^+ \times$ B($\eta \to \pi^+\pi^-\pi^0$)	(1.7 $\pm$0.6)	$\times 10^{-3}$		848
$\omega\pi^+ \times$ B($\omega \to \pi^+\pi^-\pi^0$)	$<$ 6	$\times 10^{-3}$	CL=90%	764
$\pi^+\pi^+\pi^+\pi^-\pi^-$	(2.1 $\pm$0.4)	$\times 10^{-3}$		845
$\pi^+\pi^+\pi^+\pi^-\pi^-\pi^0$	(2.9 $^{+2.9}_{-2.0}$)	$\times 10^{-3}$		799

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

$\eta\pi^+$	(7.5 $\pm$2.5)	$\times 10^{-3}$		848
$\rho^0\pi^+$	(1.05$\pm$0.31)	$\times 10^{-3}$		769
$\omega\pi^+$	$<$ 7	$\times 10^{-3}$	CL=90%	764
$\eta\rho^+$	$<$ 1.2	%	CL=90%	658
$\eta'(958)\pi^+$	$<$ 9	$\times 10^{-3}$	CL=90%	680
$\eta'(958)\rho^+$	$<$ 1.5	%	CL=90%	355

Hadronic modes with a $K\overline{K}$ pair

$K^+\overline{K}^0$		(7.4 ±1.0) $\times 10^{-3}$			792
$K^+K^-\pi^+$	[qq]	(8.8 ±0.8) $\times 10^{-3}$			744
$\phi\pi^+ \times$ B($\phi \to K^+K^-$)		(3.0 ±0.3) $\times 10^{-3}$			647
$K^+\overline{K}^*(892)^0$ $\times$ B($\overline{K}^{*0} \to K^-\pi^+$)		(2.8 ±0.4) $\times 10^{-3}$			610
$K^+K^-\pi^+$ nonresonant		(4.5 ±0.9) $\times 10^{-3}$			744
$K^0\overline{K}^0\pi^+$		—			741
$K^*(892)^+\overline{K}^0$ $\times$ B($K^{*+} \to K^0\pi^+$)		(2.1 ±1.0) %			611
$K^+K^-\pi^+\pi^0$		—			682
$\phi\pi^+\pi^0 \times$ B($\phi \to K^+K^-$)		(1.1 ±0.5) %			619
$\phi\rho^+ \times$ B($\phi \to K^+K^-$)		< 7	$\times 10^{-3}$	CL=90%	268
$K^+K^-\pi^+\pi^0$ non-ϕ		($1.5\ ^{+0.7}_{-0.6}$) %			682
$K^+\overline{K}^0\pi^+\pi^-$		< 2	%	CL=90%	678
$K^0K^-\pi^+\pi^+$		(1.0 ±0.6) %			678
$K^*(892)^+\overline{K}^*(892)^0$ $\times$ B^2($K^{*+} \to K^0\pi^+$)		(1.2 ±0.5) %			273
$K^0K^-\pi^+\pi^+$ non-$K^{*+}\overline{K}^{*0}$		< 7.9	$\times 10^{-3}$	CL=90%	678
$K^+K^-\pi^+\pi^+\pi^-$		—			600
$\phi\pi^+\pi^+\pi^-$ $\times$ B($\phi \to K^+K^-$)		< 1	$\times 10^{-3}$	CL=90%	565
$K^+K^-\pi^+\pi^+\pi^-$ nonresonant		< 3	%	CL=90%	600

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

$\phi\pi^+$	(6.1 ±0.6) $\times 10^{-3}$			647
$\phi\pi^+\pi^0$	(2.3 ±1.0) %			619
$\phi\rho^+$	< 1.4	%	CL=90%	268
$\phi\pi^+\pi^+\pi^-$	< 2	$\times 10^{-3}$	CL=90%	565
$K^+\overline{K}^*(892)^0$	(4.2 ±0.5) $\times 10^{-3}$			610
$K^*(892)^+\overline{K}^0$	(3.2 ±1.5) %			611
$K^*(892)^+\overline{K}^*(892)^0$	(2.6 ±1.1) %			273

Doubly Cabibbo suppressed (*DC*) modes,
$\Delta C = 1$ weak neutral current (*C1*) modes, or
Lepton Family number (*LF*) or Lepton number (*L*) violating modes

$K^+ \pi^+ \pi^-$	*DC*		(6.8 ±1.5)	$\times 10^{-4}$		845
$K^+ \rho^0$	*DC*		(2.5 ±1.2)	$\times 10^{-4}$		681
$K^*(892)^0 \pi^+$	*DC*		(3.6 ±1.6)	$\times 10^{-4}$		712
$K^+ \pi^+ \pi^-$ nonresonant	*DC*		(2.4 ±1.2)	$\times 10^{-4}$		845
$K^+ K^+ K^-$	*DC*		$<$ 1.4	$\times 10^{-4}$	CL=90%	550
ϕK^+	*DC*		$<$ 1.3	$\times 10^{-4}$	CL=90%	527
$\pi^+ e^+ e^-$	*C1*		$<$ 6.6	$\times 10^{-5}$	CL=90%	929
$\pi^+ \mu^+ \mu^-$	*C1*		$<$ 1.8	$\times 10^{-5}$	CL=90%	917
$\rho^+ \mu^+ \mu^-$	*C1*		$<$ 5.6	$\times 10^{-4}$	CL=90%	759
$K^+ e^+ e^-$		[ss]	$<$ 2.0	$\times 10^{-4}$	CL=90%	869
$K^+ \mu^+ \mu^-$		[ss]	$<$ 9.7	$\times 10^{-5}$	CL=90%	856
$\pi^+ e^+ \mu^-$	*LF*		$<$ 1.1	$\times 10^{-4}$	CL=90%	926
$\pi^+ e^- \mu^+$	*LF*		$<$ 1.3	$\times 10^{-4}$	CL=90%	926
$K^+ e^+ \mu^-$	*LF*		$<$ 1.3	$\times 10^{-4}$	CL=90%	866
$K^+ e^- \mu^+$	*LF*		$<$ 1.2	$\times 10^{-4}$	CL=90%	866
$\pi^- e^+ e^+$	*L*		$<$ 1.1	$\times 10^{-4}$	CL=90%	929
$\pi^- \mu^+ \mu^+$	*L*		$<$ 8.7	$\times 10^{-5}$	CL=90%	917
$\pi^- e^+ \mu^+$	*L*		$<$ 1.1	$\times 10^{-4}$	CL=90%	926
$\rho^- \mu^+ \mu^+$	*L*		$<$ 5.6	$\times 10^{-4}$	CL=90%	759
$K^- e^+ e^+$	*L*		$<$ 1.2	$\times 10^{-4}$	CL=90%	869
$K^- \mu^+ \mu^+$	*L*		$<$ 1.2	$\times 10^{-4}$	CL=90%	856
$K^- e^+ \mu^+$	*L*		$<$ 1.3	$\times 10^{-4}$	CL=90%	866
$K^*(892)^- \mu^+ \mu^+$	*L*		$<$ 8.5	$\times 10^{-4}$	CL=90%	703

D^0

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

Mass $m = 1864.6 \pm 0.5$ MeV (S = 1.1)
$m_{D^\pm} - m_{D^0} = 4.76 \pm 0.10$ MeV (S = 1.1)
Mean life $\tau = (0.415 \pm 0.004) \times 10^{-12}$ s
$c\tau = 124.4\ \mu$m
$|m_{D_1^0} - m_{D_2^0}| < 24 \times 10^{10}\ \hbar\ \text{s}^{-1}$, CL = 90% [tt]
$|\Gamma_{D_1^0} - \Gamma_{D_2^0}|/\Gamma_{D^0} < 0.20$, CL = 90% [tt]
$\Gamma(K^+ \ell^- \overline{\nu}_\ell \text{ (via } \overline{D}^0))/\Gamma(K^- \ell^+ \nu_\ell) < 0.005$, CL = 90%
$\frac{\Gamma(K^+\pi^- \text{ or } K^+\pi^-\pi^+\pi^- (\text{via}\,\overline{D}^0))}{\Gamma(K^-\pi^+ \text{ or } K^-\pi^+\pi^+\pi^-)} < 0.0085$ (or < 0.0037), CL = 90% [uu]

CP-violation decay-rate asymmetries

$A_{CP}(K^+K^-) = 0.026 \pm 0.035$
$A_{CP}(\pi^+\pi^-) = -0.05 \pm 0.08$
$A_{CP}(K^0_S\phi) = -0.03 \pm 0.09$
$A_{CP}(K^0_S\pi^0) = -0.018 \pm 0.030$

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

D^0 DECAY MODES	Fraction (Γ_i/Γ)	Scale factor/ Confidence level	p (MeV/c)
Inclusive modes			
e^+ anything	(6.75±0.29) %		–
μ^+ anything	(6.6 ±0.8) %		–
K^- anything	(53 ±4) %	S=1.3	–
$\overline{K}^0$ anything + K^0 anything	(42 ±5) %		–
K^+ anything	(3.4 $^{+0.6}_{-0.4}$) %		–
η anything	[nn] < 13 %	CL=90%	–
Semileptonic modes			
$K^-\ell^+\nu_\ell$	[oo] (3.50±0.17) %	S=1.3	867
$K^-e^+\nu_e$	(3.66±0.18) %		867
$K^-\mu^+\nu_\mu$	(3.23±0.17) %		863
$K^-\pi^0 e^+\nu_e$	(1.6 $^{+1.3}_{-0.5}$) %		861
$\overline{K}^0\pi^- e^+\nu_e$	(2.8 $^{+1.7}_{-0.9}$) %		860
$\overline{K}^*(892)^- e^+\nu_e$ $\times$ B($K^{*-} \to \overline{K}^0\pi^-$)	(1.35±0.22) %		719
$K^*(892)^-\ell^+\nu_\ell$	—		–

$\overline{K}^*(892)^0\pi^-e^+\nu_e$		—		708
$K^-\pi^+\pi^-\mu^+\nu_\mu$		$< 1.2 \times 10^{-3}$	CL=90%	821
$(\overline{K}^*(892)\pi)^-\mu^+\nu_\mu$		$< 1.4 \times 10^{-3}$	CL=90%	693
$\pi^-e^+\nu_e$		$(3.7 \pm 0.6) \times 10^{-3}$		927

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

$K^*(892)^-e^+\nu_e$		(2.02±0.33) %		719

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

$K^-\pi^+$		(3.85±0.09) %		861
$\overline{K}^0\pi^0$		(2.12±0.21) %	S=1.1	860
$\overline{K}^0\pi^+\pi^-$	[qq]	(5.4 ±0.4) %	S=1.2	842
$\overline{K}^0\rho^0$		(1.21±0.17) %		676
$\overline{K}^0 f_0(980)$		$(3.0 \pm 0.8) \times 10^{-3}$		549
$\times$ B($f_0 \to \pi^+\pi^-$)				
$\overline{K}^0 f_2(1270)$		$(2.4 \pm 0.9) \times 10^{-3}$		263
$\times$ B($f_2 \to \pi^+\pi^-$)				
$\overline{K}^0 f_0(1370)$		$(4.3 \pm 1.3) \times 10^{-3}$		–
$\times$ B($f_0 \to \pi^+\pi^-$)				
$K^*(892)^-\pi^+$		(3.4 ±0.3) %		711
$\times$ B($K^{*-} \to \overline{K}^0\pi^-$)				
$K_0^*(1430)^-\pi^+$		$(6.4 \pm 1.6) \times 10^{-3}$		364
$\times$ B($K_0^*(1430)^- \to \overline{K}^0\pi^-$)				
$\overline{K}^0\pi^+\pi^-$ nonresonant		(1.47±0.24) %		842
$K^-\pi^+\pi^0$	[qq]	(13.9 ±0.9) %	S=1.3	844
$K^-\rho^+$		(10.8 ±1.0) %		678
$K^*(892)^-\pi^+$		(1.7 ±0.2) %		711
$\times$ B($K^{*-} \to K^-\pi^0$)				
$\overline{K}^*(892)^0\pi^0$		(2.1 ±0.3) %		709
$\times$ B($\overline{K}^{*0} \to K^-\pi^+$)				
$K^-\pi^+\pi^0$ nonresonant		$(6.9 \pm 2.5) \times 10^{-3}$		844
$\overline{K}^0\pi^0\pi^0$		—		843
$\overline{K}^*(892)^0\pi^0$		(1.1 ±0.2) %		709
$\times$ B($\overline{K}^{*0} \to \overline{K}^0\pi^0$)				
$\overline{K}^0\pi^0\pi^0$ nonresonant		$(7.9 \pm 2.1) \times 10^{-3}$		843

$K^-\pi^+\pi^+\pi^-$	[qq]	(7.6 ±0.4) %	S=1.1	812
$K^-\pi^+\rho^0$ total		(6.3 ±0.4) %		612
$K^-\pi^+\rho^0$ 3-body		(4.8 ±2.1) $\times 10^{-3}$		612
$\overline{K}^*(892)^0\rho^0$		(9.8 ±2.2) $\times 10^{-3}$		418
$\times$ B($\overline{K}^{*0} \rightarrow K^-\pi^+$)				
$K^- a_1(1260)^+$		(3.6 ±0.6) %		327
$\times$ B($a_1(1260)^+ \rightarrow \pi^+\pi^+\pi^-$)				
$\overline{K}^*(892)^0\pi^+\pi^-$ total		(1.5 ±0.4) %		683
$\times$ B($\overline{K}^{*0} \rightarrow K^-\pi^+$)				
$\overline{K}^*(892)^0\pi^+\pi^-$ 3-body		(9.5 ±2.1) $\times 10^{-3}$		683
$\times$ B($\overline{K}^{*0} \rightarrow K^-\pi^+$)				
$K_1(1270)^-\pi^+$	[rr]	(3.6 ±1.0) $\times 10^{-3}$		483
$\times$ B($K_1(1270)^- \rightarrow K^-\pi^+\pi^-$)				
$K^-\pi^+\pi^+\pi^-$ nonresonant		(1.76±0.25) %		812
$\overline{K}^0\pi^+\pi^-\pi^0$	[qq]	(10.0 ±1.2) %		812
$\overline{K}^0\eta \times$ B($\eta \rightarrow \pi^+\pi^-\pi^0$)		(1.6 ±0.3) $\times 10^{-3}$		772
$\overline{K}^0\omega \times$ B($\omega \rightarrow \pi^+\pi^-\pi^0$)		(1.9 ±0.4) %		670
$K^*(892)^-\rho^+$		(4.1 ±1.6) %		422
$\times$ B($K^{*-} \rightarrow \overline{K}^0\pi^-$)				
$\overline{K}^*(892)^0\rho^0$		(4.9 ±1.1) $\times 10^{-3}$		418
$\times$ B($\overline{K}^{*0} \rightarrow \overline{K}^0\pi^0$)				
$K_1(1270)^-\pi^+$	[rr]	(5.1 ±1.4) $\times 10^{-3}$		483
$\times$ B($K_1(1270)^- \rightarrow \overline{K}^0\pi^-\pi^0$)				
$\overline{K}^*(892)^0\pi^+\pi^-$ 3-body		(4.8 ±1.1) $\times 10^{-3}$		683
$\times$ B($\overline{K}^{*0} \rightarrow \overline{K}^0\pi^0$)				
$\overline{K}^0\pi^+\pi^-\pi^0$ nonresonant		(2.1 ±2.1) %		812
$K^-\pi^+\pi^0\pi^0$		(15 ±5) %		815
$K^-\pi^+\pi^+\pi^-\pi^0$		(4.1 ±0.4) %		771
$\overline{K}^*(892)^0\pi^+\pi^-\pi^0$		(1.2 ±0.6) %		641
$\times$ B($\overline{K}^{*0} \rightarrow K^-\pi^+$)				
$\overline{K}^*(892)^0\eta$		(2.9 ±0.8) $\times 10^{-3}$		580
$\times$ B($\overline{K}^{*0} \rightarrow K^-\pi^+$)				
$\times$ B($\eta \rightarrow \pi^+\pi^-\pi^0$)				
$K^-\pi^+\omega \times$ B($\omega \rightarrow \pi^+\pi^-\pi^0$)		(2.7 ±0.5) %		605
$\overline{K}^*(892)^0\omega$		(7 ±3) $\times 10^{-3}$		406
$\times$ B($\overline{K}^{*0} \rightarrow K^-\pi^+$)				
$\times$ B($\omega \rightarrow \pi^+\pi^-\pi^0$)				
$\overline{K}^0\pi^+\pi^+\pi^-\pi^-$		(5.8 ±1.6) $\times 10^{-3}$		768
$\overline{K}^0\pi^+\pi^-\pi^0\pi^0(\pi^0)$		(10.6 $^{+7.3}_{-3.0}$) %		771
$\overline{K}^0K^+K^-$		(9.4 ±1.0) $\times 10^{-3}$		544
$\overline{K}^0\phi \times$ B($\phi \rightarrow K^+K^-$)		(4.3 ±0.5) $\times 10^{-3}$		520
$\overline{K}^0K^+K^-$ non-ϕ		(5.1 ±0.8) $\times 10^{-3}$		544

$K^0_S K^0_S K^0_S$		$(8.4 \pm 1.5) \times 10^{-4}$		538
$K^+ K^- K^- \pi^+$		$(2.1 \pm 0.5) \times 10^{-4}$		434
$K^+ K^- \overline{K}^0 \pi^0$		$(7.2 \ ^{+4.8}_{-3.5}) \times 10^{-3}$		435

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.)

$\overline{K}^0 \eta$		$(7.1 \pm 1.0) \times 10^{-3}$		772
$\overline{K}^0 \rho^0$		(1.21 ± 0.17) %		676
$K^- \rho^+$		(10.8 ± 1.0) %	S=1.2	678
$\overline{K}^0 \omega$		(2.1 ± 0.4) %		670
$\overline{K}^0 \eta'(958)$		(1.72 ± 0.26) %		565
$\overline{K}^0 f_0(980)$		$(5.7 \pm 1.6) \times 10^{-3}$		549
$\overline{K}^0 \phi$		$(8.6 \pm 1.0) \times 10^{-3}$		520
$K^- a_1(1260)^+$		(7.3 ± 1.1) %		327
$\overline{K}^0 a_1(1260)^0$		< 1.9 %	CL=90%	322
$\overline{K}^0 f_2(1270)$		$(4.2 \pm 1.5) \times 10^{-3}$		263
$K^- a_2(1320)^+$		$< 2 \times 10^{-3}$	CL=90%	197
$\overline{K}^0 f_0(1370)$		$(7.0 \pm 2.1) \times 10^{-3}$		–
$K^*(892)^- \pi^+$		(5.1 ± 0.4) %	S=1.2	711
$\overline{K}^*(892)^0 \pi^0$		(3.2 ± 0.4) %		709
$\overline{K}^*(892)^0 \pi^+ \pi^-$ total		(2.3 ± 0.5) %		683
$\overline{K}^*(892)^0 \pi^+ \pi^-$ 3-body		(1.43 ± 0.32) %		683
$K^- \pi^+ \rho^0$ total		(6.3 ± 0.4) %		612
$K^- \pi^+ \rho^0$ 3-body		$(4.8 \pm 2.1) \times 10^{-3}$		612
$\overline{K}^*(892)^0 \rho^0$		(1.47 ± 0.33) %		418
$\overline{K}^*(892)^0 \rho^0$ transverse		(1.5 ± 0.5) %		418
$\overline{K}^*(892)^0 \rho^0$ *S*-wave		(2.8 ± 0.6) %		418
$\overline{K}^*(892)^0 \rho^0$ *S*-wave long.		$< 3 \times 10^{-3}$	CL=90%	418
$\overline{K}^*(892)^0 \rho^0$ *P*-wave		$< 3 \times 10^{-3}$	CL=90%	418
$\overline{K}^*(892)^0 \rho^0$ *D*-wave		(1.9 ± 0.6) %		418
$K^*(892)^- \rho^+$		(6.1 ± 2.4) %		422
$K^*(892)^- \rho^+$ longitudinal		(2.9 ± 1.2) %		422
$K^*(892)^- \rho^+$ transverse		(3.2 ± 1.8) %		422
$K^*(892)^- \rho^+$ *P*-wave		< 1.5 %	CL=90%	422
$K^- \pi^+ f_0(980)$		< 1.1 %	CL=90%	459
$\overline{K}^*(892)^0 f_0(980)$		$< 7 \times 10^{-3}$	CL=90%	–
$K_1(1270)^- \pi^+$	[rr]	(1.06 ± 0.29) %		483
$K_1(1400)^- \pi^+$		< 1.2 %	CL=90%	386
$\overline{K}_1(1400)^0 \pi^0$		< 3.7 %	CL=90%	387

$K^*(1410)^-\pi^+$	< 1.2 %	CL=90%	378
$K_0^*(1430)^-\pi^+$	(1.04 ± 0.26) %		364
$K_2^*(1430)^-\pi^+$	$< 8 \times 10^{-3}$	CL=90%	367
$\overline{K}_2^*(1430)^0\pi^0$	$< 4 \times 10^{-3}$	CL=90%	363
$\overline{K}^*(892)^0\pi^+\pi^-\pi^0$	(1.8 ± 0.9) %		641
$\overline{K}^*(892)^0\eta$	(1.9 ± 0.5) %		580
$K^-\pi^+\omega$	(3.0 ± 0.6) %		605
$\overline{K}^*(892)^0\omega$	(1.1 ± 0.5) %		406
$K^-\pi^+\eta'(958)$	$(7.0 \pm1.8) \times 10^{-3}$		479
$\overline{K}^*(892)^0\eta'(958)$	$< 1.1 \times 10^{-3}$	CL=90%	99

Pionic modes

$\pi^+\pi^-$	$(1.53\pm0.09) \times 10^{-3}$		922
$\pi^0\pi^0$	$(8.5 \pm2.2) \times 10^{-4}$		922
$\pi^+\pi^-\pi^0$	(1.6 ± 1.1) %	S=2.7	907
$\pi^+\pi^+\pi^-\pi^-$	$(7.4 \pm0.6) \times 10^{-3}$		879
$\pi^+\pi^+\pi^-\pi^-\pi^0$	(1.9 ± 0.4) %		844
$\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-$	$(4.0 \pm3.0) \times 10^{-4}$		795

Hadronic modes with a $K\overline{K}$ pair

K^+K^-		$(4.27\pm0.16)\times10^{-3}$		791
$K^0\overline{K}^0$		$(6.5\pm1.8)\times10^{-4}$	S=1.2	788
$K^0K^-\pi^+$		$(6.4\pm1.0)\times10^{-3}$	S=1.1	739
$\overline{K}^*(892)^0K^0$		$<1.1\times10^{-3}$	CL=90%	605
$\times$ B($\overline{K}^{*0}\to K^-\pi^+$)				
$K^*(892)^+K^-$		$(2.3\pm0.5)\times10^{-3}$		610
$\times$ B($K^{*+}\to K^0\pi^+$)				
$K^0K^-\pi^+$ nonresonant		$(2.3\pm2.3)\times10^{-3}$		739
$\overline{K}^0K^+\pi^-$		$(5.0\pm1.0)\times10^{-3}$		739
$K^*(892)^0\overline{K}^0$		$<5\times10^{-4}$	CL=90%	605
$\times$ B($K^{*0}\to K^+\pi^-$)				
$K^*(892)^-K^+$		$(1.2\pm0.7)\times10^{-3}$		610
$\times$ B($K^{*-}\to \overline{K}^0\pi^-$)				
$\overline{K}^0K^+\pi^-$ nonresonant		$(3.9\,^{+2.3}_{-1.9})\times10^{-3}$		739
$K^+K^-\pi^0$		$(1.3\pm0.4)\times10^{-3}$		742
$K^0_SK^0_S\pi^0$		$<5.9\times10^{-4}$		739
$K^+K^-\pi^+\pi^-$	[vv]	$(2.52\pm0.24)\times10^{-3}$		676
$\phi\pi^+\pi^-\times$ B($\phi\to K^+K^-$)		$(5.3\pm1.4)\times10^{-4}$		614
$\phi\rho^0\times$ B($\phi\to K^+K^-$)		$(3.0\pm1.6)\times10^{-4}$		260
$K^+K^-\rho^0$ 3-body		$(9.1\pm2.3)\times10^{-4}$		309
$K^*(892)^0K^-\pi^+$ +c.c.	[ww]	$<5\times10^{-4}$		528
$\times$ B($K^{*0}\to K^+\pi^-$)				
$K^*(892)^0\overline{K}^*(892)^0$		$(6\pm2)\times10^{-4}$		257
$\times$ B^2($K^{*0}\to K^+\pi^-$)				
$K^+K^-\pi^+\pi^-$ non-ϕ		—		676
$K^+K^-\pi^+\pi^-$ nonresonant		$<8\times10^{-4}$	CL=90%	676
$K^0\overline{K}^0\pi^+\pi^-$		$(6.9\pm2.7)\times10^{-3}$		673
$K^+K^-\pi^+\pi^-\pi^0$		$(3.1\pm2.0)\times10^{-3}$		600

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

$\overline{K}^*(892)^0K^0$		$<1.6\times10^{-3}$	CL=90%	605
$K^*(892)^+K^-$		$(3.5\pm0.8)\times10^{-3}$		610
$K^*(892)^0\overline{K}^0$		$<8\times10^{-4}$	CL=90%	605
$K^*(892)^-K^+$		$(1.8\pm1.0)\times10^{-3}$		610
$\phi\pi^0$		$<1.4\times10^{-3}$	CL=90%	644
$\phi\eta$		$<2.8\times10^{-3}$	CL=90%	489
$\phi\omega$		$<2.1\times10^{-3}$	CL=90%	239
$\phi\pi^+\pi^-$		$(1.08\pm0.29)\times10^{-3}$		614
$\phi\rho^0$		$(6\pm3)\times10^{-4}$		260
$\phi\pi^+\pi^-$ 3-body		$(7\pm5)\times10^{-4}$		614
$K^*(892)^0K^-\pi^+$ + c.c.	[ww]	$<8\times10^{-4}$	CL=90%	–
$K^*(892)^0\overline{K}^*(892)^0$		$(1.4\pm0.5)\times10^{-3}$		257

Doubly Cabibbo suppressed (*DC*) modes,
$\Delta C = 2$ forbidden via mixing (*C2M*) modes,
$\Delta C = 1$ weak neutral current (*C1*) modes, or
Lepton Family number (*LF*) violating modes

$K^+ \ell^- \overline{\nu}_\ell$ (via $\overline{D}^0$)	*C2M*		< 1.7	$\times 10^{-4}$	CL=90%	–
$K^+ \pi^-$ or $K^+ \pi^- \pi^+ \pi^-$ (via $\overline{D}^0$)	*C2M*		< 1.0	$\times 10^{-3}$	CL=90%	–
$K^+ \pi^-$	*DC*		(2.8 ±0.9)	$\times 10^{-4}$		861
$K^+ \pi^-$ (via $\overline{D}^0$)			< 1.9	$\times 10^{-4}$	CL=90%	861
$K^+ \pi^- \pi^+ \pi^-$	*DC*		(1.9 ±2.7)	$\times 10^{-4}$		812
$K^+ \pi^- \pi^+ \pi^-$ (via $\overline{D}^0$)			< 4	$\times 10^{-4}$	CL=90%	812
μ^- anything (via $\overline{D}^0$)			< 4	$\times 10^{-4}$	CL=90%	–
$e^+ e^-$	*C1*		< 1.3	$\times 10^{-5}$	CL=90%	932
$\mu^+ \mu^-$	*C1*		< 4.1	$\times 10^{-6}$	CL=90%	926
$\pi^0 e^+ e^-$	*C1*		< 4.5	$\times 10^{-5}$	CL=90%	927
$\pi^0 \mu^+ \mu^-$	*C1*		< 1.8	$\times 10^{-4}$	CL=90%	915
$\eta e^+ e^-$	*C1*		< 1.1	$\times 10^{-4}$	CL=90%	852
$\eta \mu^+ \mu^-$	*C1*		< 5.3	$\times 10^{-4}$	CL=90%	838
$\rho^0 e^+ e^-$	*C1*		< 1.0	$\times 10^{-4}$	CL=90%	773
$\rho^0 \mu^+ \mu^-$	*C1*		< 2.3	$\times 10^{-4}$	CL=90%	756
$\omega e^+ e^-$	*C1*		< 1.8	$\times 10^{-4}$	CL=90%	768
$\omega \mu^+ \mu^-$	*C1*		< 8.3	$\times 10^{-4}$	CL=90%	751
$\phi e^+ e^-$	*C1*		< 5.2	$\times 10^{-5}$	CL=90%	654
$\phi \mu^+ \mu^-$	*C1*		< 4.1	$\times 10^{-4}$	CL=90%	631
$\overline{K}^0 e^+ e^-$		[*ss*]	< 1.1	$\times 10^{-4}$	CL=90%	866
$\overline{K}^0 \mu^+ \mu^-$		[*ss*]	< 2.6	$\times 10^{-4}$	CL=90%	852
$\overline{K}^*(892)^0 e^+ e^-$		[*ss*]	< 1.4	$\times 10^{-4}$	CL=90%	717
$\overline{K}^*(892)^0 \mu^+ \mu^-$		[*ss*]	< 1.18	$\times 10^{-3}$	CL=90%	698
$\pi^+ \pi^- \pi^0 \mu^+ \mu^-$	*C1*		< 8.1	$\times 10^{-4}$	CL=90%	863
$\mu^\pm e^\mp$	*LF*	[*gg*]	< 1.9	$\times 10^{-5}$	CL=90%	929
$\pi^0 e^\pm \mu^\mp$	*LF*	[*gg*]	< 8.6	$\times 10^{-5}$	CL=90%	924
$\eta e^\pm \mu^\mp$	*LF*	[*gg*]	< 1.0	$\times 10^{-4}$	CL=90%	848
$\rho^0 e^\pm \mu^\mp$	*LF*	[*gg*]	< 4.9	$\times 10^{-5}$	CL=90%	769
$\omega e^\pm \mu^\mp$	*LF*	[*gg*]	< 1.2	$\times 10^{-4}$	CL=90%	764
$\phi e^\pm \mu^\mp$	*LF*	[*gg*]	< 3.4	$\times 10^{-5}$	CL=90%	648
$\overline{K}^0 e^\pm \mu^\mp$	*LF*	[*gg*]	< 1.0	$\times 10^{-4}$	CL=90%	862
$\overline{K}^*(892)^0 e^\pm \mu^\mp$	*LF*	[*gg*]	< 1.0	$\times 10^{-4}$	CL=90%	712

$D^*(2007)^0$

$I(J^P) = \frac{1}{2}(1^-)$
I, *J*, *P* need confirmation.

Mass $m = 2006.7 \pm 0.5$ MeV (S = 1.1)
$m_{D^{*0}} - m_{D^0} = 142.12 \pm 0.07$ MeV
Full width $\Gamma < 2.1$ MeV, CL = 90%

$\overline{D}^*(2007)^0$ modes are charge conjugates of modes below.

$D^*(2007)^0$ DECAY MODES	Fraction (Γ_i/Γ)	*p* (MeV/*c*)
$D^0\pi^0$	(61.9±2.9) %	43
$D^0\gamma$	(38.1±2.9) %	137

$D^*(2010)^\pm$

$I(J^P) = \frac{1}{2}(1^-)$
I, *J*, *P* need confirmation.

Mass $m = 2010.0 \pm 0.5$ MeV (S = 1.1)
$m_{D^*(2010)^+} - m_{D^+} = 140.64 \pm 0.10$ MeV (S = 1.1)
$m_{D^*(2010)^+} - m_{D^0} = 145.397 \pm 0.030$ MeV
Full width $\Gamma < 0.131$ MeV, CL = 90%

$D^*(2010)^-$ modes are charge conjugates of the modes below.

$D^*(2010)^\pm$ DECAY MODES	Fraction (Γ_i/Γ)	*p* (MeV/*c*)
$D^0\pi^+$	(68.3±1.4) %	39
$D^+\pi^0$	(30.6±2.5) %	38
$D^+\gamma$	($1.1^{+2.1}_{-0.7}$) %	136

$D_1(2420)^0$

$I(J^P) = \frac{1}{2}(1^+)$
I, *J*, *P* need confirmation.

Mass $m = 2422.2 \pm 1.8$ MeV (S = 1.2)
Full width $\Gamma = 18.9^{+4.6}_{-3.5}$ MeV

$\overline{D}_1(2420)^0$ modes are charge conjugates of modes below.

$D_1(2420)^0$ DECAY MODES	Fraction (Γ_i/Γ)	*p* (MeV/*c*)
$D^*(2010)^+\pi^-$	seen	355
$D^+\pi^-$	not seen	474

$D_2^*(2460)^0$ $I(J^P) = \frac{1}{2}(2^+)$

$J^P = 2^+$ assignment strongly favored (ALBRECHT 89B).

Mass $m = 2458.9 \pm 2.0$ MeV (S = 1.2)

Full width $\Gamma = 23 \pm 5$ MeV

$\overline{D}_2^*(2460)^0$ modes are charge conjugates of modes below.

$D_2^*(2460)^0$ DECAY MODES	Fraction (Γ_i/Γ)	p (MeV/c)
$D^+\pi^-$	seen	503
$D^*(2010)^+\pi^-$	seen	387

$D_2^*(2460)^\pm$ $I(J^P) = \frac{1}{2}(2^+)$

$J^P = 2^+$ assignment strongly favored (ALBRECHT 89B).

Mass $m = 2459 \pm 4$ MeV (S = 1.7)

$m_{D_2^*(2460)^\pm} - m_{D_2^*(2460)^0} = 0.9 \pm 3.3$ MeV (S = 1.1)

Full width $\Gamma = 25^{+8}_{-7}$ MeV

$D_2^*(2460)^-$ modes are charge conjugates of modes below.

$D_2^*(2460)^\pm$ DECAY MODES	Fraction (Γ_i/Γ)	p (MeV/c)
$D^0\pi^+$	seen	508
$D^{*0}\pi^+$	seen	390