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 $m = 1869.62 \pm 0.20$ MeV (S = 1.1)
Mean life $\tau = (1040 \pm 7) \times 10^{-15}$ s
$c\tau = 311.8$ μm

c-quark decays

$\Gamma(c \to \ell^+ \text{anything})/\Gamma(c \to \text{anything}) = 0.096 \pm 0.004$ [a]
$\Gamma(c \to D^*(2010)^+ \text{anything})/\Gamma(c \to \text{anything}) = 0.255 \pm 0.017$

CP-violation decay-rate asymmetries

$A_{CP}(K^0_S \pi^\pm) = -0.009 \pm 0.009$
$A_{CP}(K^\mp 2\pi^\pm) = -0.005 \pm 0.010$
$A_{CP}(K^\mp \pi^\pm \pi^\pm \pi^0) = 0.010 \pm 0.013$
$A_{CP}(K^0_S \pi^\pm \pi^0) = 0.003 \pm 0.009$
$A_{CP}(K^0_S \pi^\pm \pi^+ \pi^-) = 0.001 \pm 0.013$
$A_{CP}(K^0_S K^\pm) = 0.07 \pm 0.06$
$A_{CP}(K^+ K^- \pi^\pm) = 0.006 \pm 0.007$
$A_{CP}(K^\pm K^{*0}) = 0.005 \pm 0.017$
$A_{CP}(\phi \pi^\pm) = -0.001 \pm 0.015$
$A_{CP}(\pi^+ \pi^- \pi^\pm) = -0.02 \pm 0.04$
$A_{CP}(K^0_S K^\pm \pi^+ \pi^-) = -0.04 \pm 0.07$

T-violation decay-rate asymmetry

$A_T(K^0_S K^\pm \pi^+ \pi^-) = 0.02 \pm 0.07$

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

$r_v = 1.62 \pm 0.08$ (S = 1.5)
$r_2 = 0.83 \pm 0.05$
$r_3 = 0.0 \pm 0.4$
$\Gamma_L/\Gamma_T = 1.13 \pm 0.08$
$\Gamma_+/\Gamma_- = 0.22 \pm 0.06$ (S = 1.6)

Most decay modes (other than the semileptonic modes) that involve a neutral K meson are now given as K^0_S modes, not as $\overline{K}^0$ modes. Nearly always it is a K^0_S that is measured, and interference between Cabibbo-allowed and doubly Cabibbo-suppressed modes can invalidate the assumption that $2\,\Gamma(K^0_S) = \Gamma(\overline{K}^0)$.

D^+ DECAY MODES	Fraction (Γ_i/Γ)	Scale factor/ Confidence level	p (MeV/c)
Inclusive modes			
e^+ anything	(16.0 ± 0.4) %		–
K^- anything	(25.7 ± 1.4) %		–
$\overline{K}^0$ anything + K^0 anything	(61 ± 5) %		–
K^+ anything	(5.9 ± 0.8) %		–
$K^*(892)^-$ anything	(6 ± 5) %		–
$\overline{K}^*(892)^0$ anything	(23 ± 5) %		–
$K^*(892)^0$ anything	< 6.6 %	CL=90%	–
η anything	(6.3 ± 0.7) %		–
η' anything	(1.04 ± 0.18) %		–
ϕ anything	(1.03 ± 0.12) %		–
Leptonic and semileptonic modes			
$e^+ \nu_e$	$< 2.4 \times 10^{-5}$	CL=90%	935
$\mu^+ \nu_\mu$	$(4.4 \pm 0.7) \times 10^{-4}$		932
$\tau^+ \nu_\tau$	$< 2.1 \times 10^{-3}$		90
$\overline{K}^0 e^+ \nu_e$	(8.6 ± 0.5) %		869
$\overline{K}^0 \mu^+ \nu_\mu$	(9.3 ± 0.8) %	S=1.1	865
$K^- \pi^+ e^+ \nu_e$	(4.1 ± 0.6) %	S=1.1	864
$\overline{K}^*(892)^0 e^+ \nu_e$, $\overline{K}^*(892)^0 \to K^- \pi^+$	(3.66 ± 0.21) %		722
$K^- \pi^+ e^+ \nu_e$ nonresonant	$< 7 \times 10^{-3}$	CL=90%	864
$K^- \pi^+ \mu^+ \nu_\mu$	(3.9 ± 0.5) %		851
$\overline{K}^*(892)^0 \mu^+ \nu_\mu$, $\overline{K}^*(892)^0 \to K^- \pi^+$	(3.6 ± 0.3) %		717
$K^- \pi^+ \mu^+ \nu_\mu$ nonresonant	$(2.1 \pm 0.5) \times 10^{-3}$		851
$K^- \pi^+ \pi^0 \mu^+ \nu_\mu$	$< 1.6 \times 10^{-3}$	CL=90%	825
$\pi^0 e^+ \nu_e$	$(4.4 \pm 0.7) \times 10^{-3}$		930
$\rho^0 e^+ \nu_e$	$(2.2 \pm 0.4) \times 10^{-3}$		774
$\rho^0 \mu^+ \nu_\mu$	$(2.4 \pm 0.4) \times 10^{-3}$		770
$\omega e^+ \nu_e$	$(1.6 {}^{+0.7}_{-0.6}) \times 10^{-3}$		771
$\phi e^+ \nu_e$	< 2.01 %	CL=90%	657
$\phi \mu^+ \nu_\mu$	< 2.04 %	CL=90%	651
$\eta \ell^+ \nu_\ell$	$< 7 \times 10^{-3}$	CL=90%	855
$\eta'(958) \mu^+ \nu_\mu$	< 1.1 %	CL=90%	684

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

$\overline{K}^*(892)^0 e^+ \nu_e$		(5.49 ± 0.31) %	S=1.2	722
$\overline{K}^*(892)^0 \mu^+ \nu_\mu$		(5.4 ± 0.4) %	S=1.1	717
$\overline{K}^*_0(1430)^0 \mu^+ \nu_\mu$		$< 2.5 \times 10^{-4}$		380
$\overline{K}^*(1680)^0 \mu^+ \nu_\mu$		$< 1.5 \times 10^{-3}$		105

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

$K^0_S \pi^+$		(1.45 ± 0.04) %	S=1.3	863
$K^0_L \pi^+$		(1.46 ± 0.05) %		863
$K^- \pi^+ \pi^+$	[b]	(9.22 ± 0.21) %	S=1.1	846
$(K^- \pi^+)_{S-\text{wave}} \pi^+$		(7.54 ± 0.26) %		846
$\overline{K}^*(892)^0 \pi^+$, $\overline{K}^*(892)^0 \rightarrow K^- \pi^+$		(1.22 ± 0.09) %		714
$\overline{K}^*_2(1430)^0 \pi^+$, $\overline{K}^*_2(1430)^0 \rightarrow K^- \pi^+$	[c]	$(3.0 \pm 0.8) \times 10^{-4}$		371
$\overline{K}^*(1680)^0 \pi^+$, $\overline{K}^*(1680)^0 \rightarrow K^- \pi^+$	[c]	$(1.6 \pm 0.6) \times 10^{-3}$		58
$K^0_S \pi^+ \pi^0$	[b]	(6.8 ± 0.5) %	S=1.9	845
$K^0_S \rho^+$		(4.6 ± 1.0) %		677
$\overline{K}^*(892)^0 \pi^+$, $\overline{K}^*(892)^0 \rightarrow K^0_S \pi^0$		(1.3 ± 0.6) %		714
$K^0_S \pi^+ \pi^0$ nonresonant		$(9 \pm 7) \times 10^{-3}$		845
$K^- \pi^+ \pi^+ \pi^0$	[b]	(6.00 ± 0.20) %	S=1.2	816
$\overline{K}^*(892)^0 \rho^+$ total, $\overline{K}^*(892)^0 \rightarrow K^- \pi^+$		(1.3 ± 0.8) %		422
$\overline{K}_1(1400)^0 \pi^+$, $\overline{K}_1(1400)^0 \rightarrow K^- \pi^+ \pi^0$		(1.8 ± 0.7) %		390
$K^- \rho^+ \pi^+$ total		$(2.9 {}^{+1.0}_{-0.9})$ %		613
$K^- \rho^+ \pi^+$ 3-body		(1.0 ± 0.4) %		613
$\overline{K}^*(892)^0 \pi^+ \pi^0$ total, $\overline{K}^*(892)^0 \rightarrow K^- \pi^+$		(4.2 ± 0.6) %		690
$\overline{K}^*(892)^0 \pi^+ \pi^0$ 3-body, $\overline{K}^*(892)^0 \rightarrow K^- \pi^+$		(2.7 ± 0.8) %		690
$K^*(892)^- \pi^+ \pi^+$ 3-body, $K^*(892)^- \rightarrow K^- \pi^0$		$(6 \pm 3) \times 10^{-3}$		688
$K^- \pi^+ \pi^+ \pi^0$ nonresonant	[d]	(1.1 ± 0.5) %		816
$K^0_S \pi^+ \pi^+ \pi^-$	[b]	(3.02 ± 0.12) %	S=1.3	814
$K^0_S a_1(1260)^+$, $a_1(1260)^+ \rightarrow \pi^+ \pi^+ \pi^-$		(1.8 ± 0.3) %		328
$\overline{K}_1(1400)^0 \pi^+$, $\overline{K}_1(1400)^0 \rightarrow K^0_S \pi^+ \pi^-$		(1.8 ± 0.7) %		390

$K^*(892)^- \pi^+ \pi^+$ 3-body, $K^*(892)^- \rightarrow K^0_S \pi^-$		(1.3 ±0.6) %		688
$K^0_S \rho^0 \pi^+$ total		(1.8 ±0.6) %		611
$K^0_S \rho^0 \pi^+$ 3-body		(2.1 ±2.2) $\times 10^{-3}$		611
$K^0_S \pi^+ \pi^+ \pi^-$ nonresonant		(3.6 ±1.8) $\times 10^{-3}$		814
$K^- 3\pi^+ \pi^-$	[b]	(5.6 ±0.5) $\times 10^{-3}$	S=1.1	772
$\overline{K}^*(892)^0 \pi^+ \pi^+ \pi^-$, $\overline{K}^*(892)^0 \rightarrow K^- \pi^+$		(1.2 ±0.4) $\times 10^{-3}$		645
$\overline{K}^*(892)^0 \rho^0 \pi^+$, $\overline{K}^*(892)^0 \rightarrow K^- \pi^+$		(2.3 ±0.4) $\times 10^{-3}$		239
$K^- \rho^0 \pi^+ \pi^+$		(1.69±0.28) $\times 10^{-3}$		524
$K^- 3\pi^+ \pi^-$ nonresonant		(3.9 ±2.9) $\times 10^{-4}$		772
$K^+ 2K^0_S$		(4.5 ±2.1) $\times 10^{-3}$		545
$K^+ K^- K^0_S \pi^+$		(2.3 ±0.5) $\times 10^{-4}$		436

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

$K^0_S a_1(1260)^+$		(3.5 ±0.6) %		329
$K^0_S a_2(1320)^+$		< 1.5 $\times 10^{-3}$	CL=90%	200
$\overline{K}^*(892)^0 \rho^+$ total	[d]	(2.0 ±1.2) %		422
$\overline{K}^*(892)^0 \rho^+$ S-wave	[d]	(1.5 ±1.5) %		422
$\overline{K}^*(892)^0 \rho^+$ P-wave		< 1 $\times 10^{-3}$	CL=90%	422
$\overline{K}^*(892)^0 \rho^+$ D-wave		(9 ±6) $\times 10^{-3}$		422
$\overline{K}^*(892)^0 \rho^+$ D-wave longitudinal		< 7 $\times 10^{-3}$	CL=90%	422
$\overline{K}_1(1270)^0 \pi^+$		< 7 $\times 10^{-3}$	CL=90%	487
$\overline{K}_1(1400)^0 \pi^+$		(3.8 ±1.3) %		390
$\overline{K}^*(892)^0 \pi^+ \pi^0$ total		(6.3 ±0.8) %		690
$\overline{K}^*(892)^0 \pi^+ \pi^0$ 3-body	[d]	(4.0 ±1.2) %		690
$K^*(892)^- \pi^+ \pi^+$ total		—		689
$K^*(892)^- \pi^+ \pi^+$ 3-body		(1.4 ±0.9) %		689
$\overline{K}^*(892)^0 a_1(1260)^+$		(9.1 ±1.8) $\times 10^{-3}$		†

Pionic modes

$\pi^+ \pi^0$		(1.24±0.07) $\times 10^{-3}$		925
$\pi^+ \pi^+ \pi^-$		(3.21±0.19) $\times 10^{-3}$		909
$\rho^0 \pi^+$		(8.2 ±1.5) $\times 10^{-4}$		767
$\pi^+ (\pi^+ \pi^-)_{S-\text{wave}}$		(1.80±0.16) $\times 10^{-3}$		909
$\sigma \pi^+$, $\sigma \rightarrow \pi^+ \pi^-$		(1.35±0.12) $\times 10^{-3}$		–
$f_0(980) \pi^+$, $f_0(980) \rightarrow \pi^+ \pi^-$		(1.54±0.33) $\times 10^{-4}$		669
$f_0(1370) \pi^+$, $f_0(1370) \rightarrow \pi^+ \pi^-$		(8 ±4) $\times 10^{-5}$		–
$f_2(1270) \pi^+$, $f_2(1270) \rightarrow \pi^+ \pi^-$		(5.0 ±0.9) $\times 10^{-4}$		485

$\rho(1450)^0 \pi^+$, $\rho(1450)^0 \to \pi^+ \pi^-$		$< 8 \times 10^{-5}$	CL=95%	338
$f_0(1500) \pi^+$, $f_0(1500) \to \pi^+ \pi^-$		$(1.1 \pm 0.4) \times 10^{-4}$		–
$f_0(1710) \pi^+$, $f_0(1710) \to \pi^+ \pi^-$		$< 5 \times 10^{-5}$	CL=95%	–
$f_0(1790) \pi^+$, $f_0(1790) \to \pi^+ \pi^-$		$< 6 \times 10^{-5}$	CL=95%	–
$(\pi^+ \pi^+)_{S-\text{wave}} \pi^-$		$< 1.2 \times 10^{-4}$	CL=95%	909
$\pi^+ \pi^+ \pi^-$ nonresonant		$< 1.1 \times 10^{-4}$	CL=95%	909
$\pi^+ 2\pi^0$		$(4.6 \pm 0.4) \times 10^{-3}$		910
$\pi^+ \pi^+ \pi^- \pi^0$		(1.14 ± 0.08) %		883
$\eta \pi^+$, $\eta \to \pi^+ \pi^- \pi^0$		$(7.7 \pm 0.7) \times 10^{-4}$		848
$\omega \pi^+$, $\omega \to \pi^+ \pi^- \pi^0$		$< 3 \times 10^{-4}$	CL=90%	763
$3\pi^+ 2\pi^-$		$(1.63 \pm 0.16) \times 10^{-3}$	S=1.1	845

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

$\eta \pi^+$		$(3.39 \pm 0.29) \times 10^{-3}$		848
$\omega \pi^+$		$< 3.4 \times 10^{-4}$	CL=90%	764
$\eta \rho^+$		$< 7 \times 10^{-3}$	CL=90%	655
$\eta'(958) \pi^+$		$(5.1 \pm 1.0) \times 10^{-3}$		681
$\eta'(958) \rho^+$		$< 5 \times 10^{-3}$	CL=90%	349

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

$K^+ K^0_S$		$(2.89 \pm 0.17) \times 10^{-3}$		793
$K^+ K^- \pi^+$	[b]	$(9.63 \pm 0.31) \times 10^{-3}$	S=1.3	744
$\phi \pi^+$, $\phi \to K^+ K^-$		$(3.06 \pm 0.34) \times 10^{-3}$		647
$K^+ \overline{K}^*(892)^0$, $\overline{K}^*(892)^0 \to K^- \pi^+$		$(2.90 \pm 0.32) \times 10^{-3}$		613
$K^+ \overline{K}^*_0(1430)^0$, $\overline{K}^*_0(1430)^0 \to K^- \pi^+$		$(3.6 \pm 0.4) \times 10^{-3}$		–
$K^0_S K^0_S \pi^+$		—		741
$K^*(892)^+ K^0_S$, $K^*(892)^+ \to K^0_S \pi^+$		$(5.3 \pm 2.3) \times 10^{-3}$		611
$K^+ K^- \pi^+ \pi^0$		—		682
$\phi \pi^+ \pi^0$, $\phi \to K^+ K^-$		(1.1 ± 0.5) %		619
$\phi \rho^+$, $\phi \to K^+ K^-$		$< 7 \times 10^{-3}$	CL=90%	258
$K^+ K^- \pi^+ \pi^0$ non-ϕ		$(1.5 {}^{+0.7}_{-0.6})$ %		682
$K^+ K^0_S \pi^+ \pi^-$		$(1.69 \pm 0.18) \times 10^{-3}$		678
$K^0_S K^- \pi^+ \pi^+$		$(2.32 \pm 0.18) \times 10^{-3}$		678
$K^+ K^- \pi^+ \pi^+ \pi^-$		$(2.3 \pm 1.2) \times 10^{-4}$		600

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

$\phi\pi^+$		$(6.2 \pm 0.7) \times 10^{-3}$		647
$\phi\pi^+\pi^0$		(2.3 ± 1.0) %		619
$\phi\rho^+$		< 1.5 %	CL=90%	259
$K^+\overline{K}^*(892)^0$		$(4.4 \pm 0.5) \times 10^{-3}$		613
$K^*(892)^+K^0_S$		(1.6 ± 0.7) %		612

Doubly Cabibbo-suppressed modes

$K^+\pi^0$		$(2.37 \pm 0.32) \times 10^{-4}$		864
$K^+\pi^+\pi^-$		$(6.2 \pm 0.7) \times 10^{-4}$		846
$K^+\rho^0$		$(2.4 \pm 0.6) \times 10^{-4}$		679
$K^*(892)^0\pi^+$, $K^*(892)^0 \to K^+\pi^-$		$(2.9 \pm 0.6) \times 10^{-4}$		714
$K^+f_0(980)$, $f_0(980) \to \pi^+\pi^-$		$(5.6 \pm 3.4) \times 10^{-5}$		–
$K^*_2(1430)^0\pi^+$, $K^*_2(1430)^0 \to K^+\pi^-$		$(5.0 \pm 3.4) \times 10^{-5}$		–
$K^+K^+K^-$		$(8.7 \pm 2.0) \times 10^{-5}$		550

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

$\pi^+e^+e^-$	*C1*		$< 7.4 \times 10^{-6}$	CL=90%	930
$\pi^+\phi$, $\phi \to e^+e^-$		[e]	$(2.7 {}^{+3.6}_{-1.8}) \times 10^{-6}$		–
$\pi^+\mu^+\mu^-$	*C1*		$< 3.9 \times 10^{-6}$	CL=90%	918
$\rho^+\mu^+\mu^-$	*C1*		$< 5.6 \times 10^{-4}$	CL=90%	757
$K^+e^+e^-$		[f]	$< 6.2 \times 10^{-6}$	CL=90%	870
$K^+\mu^+\mu^-$		[f]	$< 9.2 \times 10^{-6}$	CL=90%	856
$\pi^+e^\pm\mu^\mp$	*LF*	[g]	$< 3.4 \times 10^{-5}$	CL=90%	927
$K^+e^\pm\mu^\mp$	*LF*	[g]	$< 6.8 \times 10^{-5}$	CL=90%	866
$\pi^-e^+e^+$	*L*		$< 3.6 \times 10^{-6}$	CL=90%	930
$\pi^-\mu^+\mu^+$	*L*		$< 4.8 \times 10^{-6}$	CL=90%	918
$\pi^-e^+\mu^+$	*L*		$< 5.0 \times 10^{-5}$	CL=90%	927
$\rho^-\mu^+\mu^+$	*L*		$< 5.6 \times 10^{-4}$	CL=90%	757
$K^-e^+e^+$	*L*		$< 4.5 \times 10^{-6}$	CL=90%	870
$K^-\mu^+\mu^+$	*L*		$< 1.3 \times 10^{-5}$	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

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

Mass $m = 1864.84 \pm 0.17$ MeV (S = 1.1)
$m_{D^\pm} - m_{D^0} = 4.78 \pm 0.10$ MeV (S = 1.1)
Mean life $\tau = (410.1 \pm 1.5) \times 10^{-15}$ s
$c\tau = 122.9\ \mu$m
$\left|m_{D_1^0} - m_{D_2^0}\right| = (2.37^{+0.66}_{-0.71}) \times 10^{10}\ \hbar\ \mathrm{s}^{-1}$
$(\Gamma_{D_1^0} - \Gamma_{D_2^0})/\Gamma = 2y = (1.56^{+0.36}_{-0.38}) \times 10^{-2}$
$\left|q/p\right| = 0.86 \pm 0.31$
$A_\Gamma = (1.4 \pm 2.7) \times 10^{-3}$
$\Gamma(K^+\ell^-\overline{\nu}_\ell$ (via $\overline{D}^0$))$/\Gamma(K^-\ell^+\nu_\ell) < 0.005$, CL = 90%
$\Gamma\left(K^+\pi^-\text{ via }\overline{D}^0\right)/\Gamma\left(K^-\pi^+\right) < 4.0 \times 10^{-4}$, CL = 95%
$\Gamma\left(K_S^0\pi^+\pi^-\text{ in }D^0 \to \overline{D}^0\right)/\Gamma\left(K_S^0\pi^+\pi^-\right) < 0.0063$, CL = 95%

CP-violation decay-rate asymmetries

$A_{CP}(K^+K^-) = (0.1 \pm 0.5) \times 10^{-2}$ (S = 1.4)
$A_{CP}(K_S^0K_S^0) = -0.23 \pm 0.19$
$A_{CP}(\pi^+\pi^-) = (0.0 \pm 0.5) \times 10^{-2}$
$A_{CP}(\pi^0\pi^0) = 0.00 \pm 0.05$
$A_{CP}(\pi^+\pi^-\pi^0) = 0.004 \pm 0.013$
$A_{CP}(K_S^0\phi) = -0.03 \pm 0.09$
$A_{CP}(K_S^0\pi^0) = 0.001 \pm 0.013$
$A_{CP}(K^\mp\pi^\pm)$ in $D^0 \to K^-\pi^+$, $\overline{D}^0 \to K^+\pi^- = -0.004 \pm 0.010$
$A_{CP}(K^\pm\pi^\mp) = 0.022 \pm 0.032$
$A_{CP}(K^\mp\pi^\pm\pi^0) = 0.002 \pm 0.009$
$A_{CP}(K^\pm\pi^\mp\pi^0) = 0.00 \pm 0.05$
$A_{CP}(K_S^0\pi^+\pi^-) = -0.009^{+0.026}_{-0.061}$
$A_{CP}(K^*(892)^\mp\pi^\pm \to K_S^0\pi^+\pi^-)$ in $D^0 \to K^{*-}\pi^+$, $\overline{D}^0 \to K^{*+}\pi^- < 3.5 \times 10^{-4}$, CL = 95%
$A_{CP}(K^*(892)^\pm\pi^\mp \to K_S^0\pi^+\pi^-)$ in $D^0 \to K^{*+}\pi^-$, $\overline{D}^0 \to K^{*-}\pi^+ < 7.8 \times 10^{-4}$, CL = 95%
$A_{CP}(K_S^0\rho^0 \to K_S^0\pi^+\pi^-)$ in $D^0 \to \overline{K}^0\rho^0$, $\overline{D}^0 \to K^0\rho^0 < 4.8 \times 10^{-4}$, CL = 95%
$A_{CP}(K_S^0\omega \to K_S^0\pi^+\pi^-)$ in $D^0 \to \overline{K}^0\omega$, $\overline{D}^0 \to K^0\omega < 9.2 \times 10^{-4}$, CL = 95%
$A_{CP}(K_S^0 f_0(980) \to K_S^0\pi^+\pi^-)$ in $D^0 \to \overline{K}^0 f_0(980)$, $\overline{D}^0 \to K^0 f_0(980) < 6.8 \times 10^{-4}$, CL = 95%
$A_{CP}(K_S^0 f_2(1270) \to K_S^0\pi^+\pi^-)$ in $D^0 \to \overline{K}^0 f_2(1270)$, $\overline{D}^0 \to K^0 f_2(1270) < 13.5 \times 10^{-4}$, CL = 95%
$A_{CP}(K_S^0 f_0(1370) \to K_S^0\pi^+\pi^-)$ in $D^0 \to \overline{K}^0 f_0(1370)$, $\overline{D}^0 \to K^0 f_0(1370) < 25.5 \times 10^{-4}$, CL = 95%

$A_{CP}(K_0^*(1430)^\mp \pi^\pm \to K_S^0 \pi^+ \pi^-)$ in $D^0 \to K_0^*(1430)^- \pi^+$, $\overline{D}^0 \to K_0^*(1430)^+ \pi^- < 9.0 \times 10^{-4}$, CL = 95%

$A_{CP}(K_2^*(1430)^\mp \pi^\pm \to K_S^0 \pi^+ \pi^-)$ in $D^0 \to K_2^*(1430)^- \pi^+$, $\overline{D}^0 \to K_2^*(1430)^+ \pi^- < 6.5 \times 10^{-4}$, CL = 95%

$A_{CP}(K^*(1680)^\mp \pi^\pm \to K_S^0 \pi^+ \pi^-)$ in $D^0 \to K^*(1680)^- \pi^+$, $\overline{D}^0 \to K^*(1680)^+ \pi^- < 28.4 \times 10^{-4}$, CL = 95%

$A_{CP}(K^- \pi^+ \pi^+ \pi^-)$ in $D^0 \to K^- \pi^+ \pi^+ \pi^-$, $\overline{D}^0 \to K^+ \pi^- \pi^- \pi^+ = 0.007 \pm 0.010$

$A_{CP}(K^\pm \pi^\mp \pi^+ \pi^-) = -0.02 \pm 0.04$

$A_{CP}(K^+ K^- \pi^+ \pi^-) = -0.08 \pm 0.07$

T-violation decay-rate asymmetry

$A_T(K^+ K^- \pi^+ \pi^-) = 0.01 \pm 0.07$

CPT-violation decay-rate asymmetry

$A_{CPT}(K^\mp \pi^\pm) = 0.008 \pm 0.008$

Most decay modes (other than the semileptonic modes) that involve a neutral K meson are now given as K_S^0 modes, not as $\overline{K}^0$ modes. Nearly always it is a K_S^0 that is measured, and interference between Cabibbo-allowed and doubly Cabibbo-suppressed modes can invalidate the assumption that $2\,\Gamma(K_S^0) = \Gamma(\overline{K}^0)$.

D^0 DECAY MODES		Fraction (Γ_i/Γ)	Scale factor/ Confidence level	p (MeV/c)
Topological modes				
0-prongs	[h]	(15 ±6) %		–
2-prongs		(71 ±6) %		–
4-prongs	[i]	(14.6 ±0.5) %		–
6-prongs		(1.2 $^{+1.3}_{-0.7}$) $\times 10^{-3}$		–
Inclusive modes				
e^+ anything	[j]	(6.53 ±0.17) %		–
μ^+ anything		(6.7 ±0.6) %		–
K^- anything		(54.7 ±2.8) %	S=1.3	–
$\overline{K}^0$ anything + K^0 anything		(47 ±4) %		–
K^+ anything		(3.4 ±0.4) %		–
$K^*(892)^-$ anything		(15 ±9) %		–
$\overline{K}^*(892)^0$ anything		(9 ±4) %		–
$K^*(892)^+$ anything		< 3.6 %	CL=90%	–
$K^*(892)^0$ anything		(2.8 ±1.3) %		–
η anything		(9.5 ±0.9) %		–
η' anything		(2.48 ±0.27) %		–
ϕ anything		(1.05 ±0.11) %		–

Semileptonic modes

$K^- e^+ \nu_e$		(3.58 ± 0.06) %	S=1.1	867
$K^- \mu^+ \nu_\mu$		(3.31 ± 0.13) %		864
$K^*(892)^- e^+ \nu_e$		(2.18 ± 0.16) %		719
$K^*(892)^- \mu^+ \nu_\mu$		(2.01 ± 0.25) %		714
$K^- \pi^0 e^+ \nu_e$		$(1.6 \; {}^{+1.3}_{-0.5})$ %		861
$\overline{K}^0 \pi^- e^+ \nu_e$		$(2.7 \; {}^{+0.9}_{-0.7})$ %		860
$K^- \pi^+ \pi^- e^+ \nu_e$		$(2.8 \; {}^{+1.4}_{-1.1}) \times 10^{-4}$		843
$K_1(1270)^- e^+ \nu_e$		$(7.6 \; {}^{+4.2}_{-3.1}) \times 10^{-4}$		498
$K^- \pi^+ \pi^- \mu^+ \nu_\mu$		$< 1.2 \times 10^{-3}$	CL=90%	821
$(\overline{K}^*(892)\pi)^- \mu^+ \nu_\mu$		$< 1.4 \times 10^{-3}$	CL=90%	692
$\pi^- e^+ \nu_e$		$(2.83 \pm 0.17) \times 10^{-3}$		927
$\pi^- \mu^+ \nu_\mu$		$(2.37 \pm 0.24) \times 10^{-3}$		924
$\rho^- e^+ \nu_e$		$(1.9 \pm 0.4) \times 10^{-3}$		771

Hadronic modes with one $\overline{K}$

$K^- \pi^+$		(3.89 ± 0.05) %	S=1.1	861
$K^0_S \pi^0$		(1.22 ± 0.06) %	S=1.2	860
$K^0_L \pi^0$		$(10.0 \pm 0.7) \times 10^{-3}$		860
$K^0_S \pi^+ \pi^-$	[b]	(2.99 ± 0.17) %	S=1.1	842
$K^0_S \rho^0$		$(7.7 \; {}^{+0.6}_{-0.8}) \times 10^{-3}$		674
$K^0_S \omega$, $\omega \to \pi^+ \pi^-$		$(2.2 \pm 0.6) \times 10^{-4}$		670
$K^0_S f_0(980)$, $f_0(980) \to \pi^+ \pi^-$		$(1.40 \; {}^{+0.30}_{-0.22}) \times 10^{-3}$		549
$K^0_S f_2(1270)$, $f_2(1270) \to \pi^+ \pi^-$		$(1.3 \; {}^{+1.2}_{-0.7}) \times 10^{-4}$		262
$K^0_S f_0(1370)$, $f_0(1370) \to \pi^+ \pi^-$		$(2.5 \; {}^{+0.6}_{-0.7}) \times 10^{-3}$		†
$K^*(892)^- \pi^+$, $K^*(892)^- \to K^0_S \pi^-$		(1.97 ± 0.13) %		711
$K^*(892)^+ \pi^-$, $K^*(892)^+ \to K^0_S \pi^+$	[k]	$(1.0 \; {}^{+1.3}_{-0.4}) \times 10^{-4}$		711
$K^*_0(1430)^- \pi^+$, $K^*_0(1430)^- \to K^0_S \pi^-$		$(2.9 \; {}^{+0.7}_{-0.4}) \times 10^{-3}$		378
$K^*_2(1430)^- \pi^+$, $K^*_2(1430)^- \to K^0_S \pi^-$		$(3.3 \; {}^{+2.2}_{-1.1}) \times 10^{-4}$		367
$K^*(1680)^- \pi^+$, $K^*(1680)^- \to K^0_S \pi^-$		$(7 \; {}^{+6}_{-5}) \times 10^{-4}$		46

$K^0_S \pi^+ \pi^-$ nonresonant		$(2.7 \; {}^{+6.1}_{-1.7}) \times 10^{-4}$		842
$K^- \pi^+ \pi^0$	[b]	(13.9 ± 0.5) %	S=1.6	844
$K^- \rho^+$		(10.8 ± 0.7) %		675
$K^- \rho(1700)^+$, $\rho(1700)^+ \to \pi^+ \pi^0$		$(7.9 \pm 1.7) \times 10^{-3}$		†
$K^*(892)^- \pi^+$, $K^*(892)^- \to K^- \pi^0$		$(2.22 \; {}^{+0.36}_{-0.19})$ %		711
$\overline{K}^*(892)^0 \pi^0$, $\overline{K}^*(892)^0 \to K^- \pi^+$		(1.88 ± 0.23) %		711
$K^*_0(1430)^- \pi^+$, $K^*_0(1430)^- \to K^- \pi^0$		$(4.6 \pm 2.1) \times 10^{-3}$		378
$\overline{K}^*_0(1430)^0 \pi^0$, $\overline{K}^*_0(1430)^0 \to K^- \pi^+$		$(5.7 \; {}^{+4.5}_{-1.5}) \times 10^{-3}$		379
$K^*(1680)^- \pi^+$, $K^*(1680)^- \to K^- \pi^0$		$(1.8 \pm 0.7) \times 10^{-3}$		46
$K^- \pi^+ \pi^0$ nonresonant		$(1.11 \; {}^{+0.53}_{-0.19})$ %		844
$K^0_S \pi^0 \pi^0$		—		843
$\overline{K}^*(892)^0 \pi^0$, $\overline{K}^*(892)^0 \to K^0_S \pi^0$		$(6.7 \; {}^{+1.8}_{-1.5}) \times 10^{-3}$		711
$K^0_S \pi^0 \pi^0$ nonresonant		$(4.5 \pm 1.1) \times 10^{-3}$		843
$K^- \pi^+ \pi^+ \pi^-$	[b]	(8.10 ± 0.20) %	S=1.3	813
$K^- \pi^+ \rho^0$ total		(6.76 ± 0.33) %		609
$K^- \pi^+ \rho^0$ 3-body		$(5.1 \pm 2.3) \times 10^{-3}$		609
$\overline{K}^*(892)^0 \rho^0$, $\overline{K}^*(892)^0 \to K^- \pi^+$		(1.00 ± 0.22) %		416
$K^- a_1(1260)^+$, $a_1(1260)^+ \to \pi^+ \pi^+ \pi^-$		(3.6 ± 0.6) %		327
$\overline{K}^*(892)^0 \pi^+ \pi^-$ total, $\overline{K}^*(892)^0 \to K^- \pi^+$		(1.5 ± 0.4) %		685
$\overline{K}^*(892)^0 \pi^+ \pi^-$ 3-body, $\overline{K}^*(892)^0 \to K^- \pi^+$		$(9.7 \pm 2.1) \times 10^{-3}$		685
$K_1(1270)^- \pi^+$, $K_1(1270)^- \to K^- \pi^+ \pi^-$	[d]	$(2.9 \pm 0.3) \times 10^{-3}$		484
$K^- \pi^+ \pi^+ \pi^-$ nonresonant		(1.88 ± 0.26) %		813
$K^0_S \pi^+ \pi^- \pi^0$	[b]	(5.4 ± 0.6) %		813
$K^0_S \eta$, $\eta \to \pi^+ \pi^- \pi^0$		$(8.6 \pm 1.4) \times 10^{-4}$		772
$K^0_S \omega$, $\omega \to \pi^+ \pi^- \pi^0$		$(9.8 \pm 1.8) \times 10^{-3}$		670
$K^*(892)^- \rho^+$, $K^*(892)^- \to K^0_S \pi^-$		(2.1 ± 0.8) %		416
$K_1(1270)^- \pi^+$, $K_1(1270)^- \to K^0_S \pi^- \pi^0$	[d]	$(2.2 \pm 0.6) \times 10^{-3}$		484

$\overline{K}^*(892)^0 \pi^+ \pi^-$ 3-body, $\overline{K}^*(892)^0 \rightarrow K^0_S \pi^0$	$(2.4 \pm 0.5) \times 10^{-3}$		685
$K^0_S \pi^+ \pi^- \pi^0$ nonresonant	(1.1 ± 1.2) %		813
$K^- \pi^+ \pi^+ \pi^- \pi^0$	(4.2 ± 0.4) %		771
$\overline{K}^*(892)^0 \pi^+ \pi^- \pi^0$, $\overline{K}^*(892)^0 \rightarrow K^- \pi^+$	(1.2 ± 0.6) %		643
$K^- \pi^+ \omega$, $\omega \rightarrow \pi^+ \pi^- \pi^0$	(2.7 ± 0.5) %		605
$\overline{K}^*(892)^0 \omega$, $\overline{K}^*(892)^0 \rightarrow K^- \pi^+$, $\omega \rightarrow \pi^+ \pi^- \pi^0$	$(6.5 \pm 2.4) \times 10^{-3}$		410
$K^0_S \eta \pi^0$	$(5.6 \pm 1.2) \times 10^{-3}$		721
$K^0_S a_0(980)$, $a_0(980) \rightarrow \eta \pi^0$	$(6.7 \pm 2.1) \times 10^{-3}$		–
$\overline{K}^*(892)^0 \eta$, $\overline{K}^*(892)^0 \rightarrow K^0_S \pi^0$	$(1.6 \pm 0.5) \times 10^{-3}$		–
$K^0_S 2\pi^+ 2\pi^-$	$(2.84 \pm 0.31) \times 10^{-3}$		768
$K^0_S \rho^0 \pi^+ \pi^-$, no $K^*(892)^-$	$(1.1 \pm 0.7) \times 10^{-3}$		–
$K^*(892)^- \pi^+ \pi^+ \pi^-$, $K^*(892)^- \rightarrow K^0_S \pi^-$, no ρ^0	$(5 \pm 8) \times 10^{-4}$		642
$K^*(892)^- \rho^0 \pi^+$, $K^*(892)^- \rightarrow K^0_S \pi^-$	$(1.7 \pm 0.7) \times 10^{-3}$		230
$K^0_S 2\pi^+ 2\pi^-$ nonresonant	$< 1.3 \times 10^{-3}$	CL=90%	768
$K^- 3\pi^+ 2\pi^-$	$(2.2 \pm 0.6) \times 10^{-4}$		713

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.)

$K^0_S \eta$	$(4.0 \pm 0.5) \times 10^{-3}$		772
$K^0_S \omega$	(1.13 ± 0.20) %		670
$K^0_S \eta'(958)$	$(9.4 \pm 1.4) \times 10^{-3}$		565
$K^- a_1(1260)^+$	(7.8 ± 1.1) %		327
$\overline{K}^0 a_1(1260)^0$	< 1.9 %	CL=90%	323
$K^- a_2(1320)^+$	$< 2 \times 10^{-3}$	CL=90%	198
$\overline{K}^*(892)^0 \pi^+ \pi^-$ total	(2.4 ± 0.5) %		685
$\overline{K}^*(892)^0 \pi^+ \pi^-$ 3-body	(1.53 ± 0.34) %		685
$\overline{K}^*(892)^0 \rho^0$	(1.58 ± 0.35) %		417
$\overline{K}^*(892)^0 \rho^0$ transverse	(1.6 ± 0.6) %		417
$\overline{K}^*(892)^0 \rho^0$ S-wave	(3.0 ± 0.6) %		417
$\overline{K}^*(892)^0 \rho^0$ S-wave long.	$< 3 \times 10^{-3}$	CL=90%	417
$\overline{K}^*(892)^0 \rho^0$ P-wave	$< 3 \times 10^{-3}$	CL=90%	417
$\overline{K}^*(892)^0 \rho^0$ D-wave	(2.1 ± 0.6) %		417
$K^*(892)^- \rho^+$	(6.6 ± 2.6) %		417

$K^*(892)^- \rho^+$ longitudinal		(3.2 ±1.3) %			417
$K^*(892)^- \rho^+$ transverse		(3.5 ±2.0) %			417
$K^*(892)^- \rho^+$ P-wave		< 1.5	%	CL=90%	417
$K_1(1270)^- \pi^+$	[d]	(1.15 ±0.32) %			484
$K_1(1400)^- \pi^+$		< 1.2	%	CL=90%	386
$\overline{K}_1(1400)^0 \pi^0$		< 3.7	%	CL=90%	387
$\overline{K}^*(892)^0 \pi^+ \pi^- \pi^0$		(1.9 ±0.9) %			643
$K^- \pi^+ \omega$		(3.0 ±0.6) %			605
$\overline{K}^*(892)^0 \omega$		(1.1 ±0.5) %			410
$K^- \pi^+ \eta'(958)$		(7.5 ±1.9) $\times 10^{-3}$			479
$\overline{K}^*(892)^0 \eta'(958)$		< 1.1	$\times 10^{-3}$	CL=90%	120

Hadronic modes with three K's

$K^0_S K^+ K^-$		(4.72 ±0.32) $\times 10^{-3}$			544
$K^0_S a_0(980)^0$, $a^0_0 \to K^+ K^-$		(3.1 ±0.4) $\times 10^{-3}$			–
$K^- a_0(980)^+$, $a^+_0 \to K^+ K^0_S$		(6.3 ±1.9) $\times 10^{-4}$			–
$K^+ a_0(980)^-$, $a^-_0 \to K^- K^0_S$		< 1.2	$\times 10^{-4}$	CL=95%	–
$K^0_S f_0(980)$, $f_0 \to K^+ K^-$		< 1.0	$\times 10^{-4}$	CL=95%	–
$K^0_S \phi$, $\phi \to K^+ K^-$		(2.17 ±0.15) $\times 10^{-3}$			520
$K^0_S f_0(1400)$, $f_0 \to K^+ K^-$		(1.8 ±1.1) $\times 10^{-4}$			–
$3K^0_S$		(9.6 ±1.4) $\times 10^{-4}$			539
$K^+ K^- K^- \pi^+$		(2.22 ±0.32) $\times 10^{-4}$			434
$K^+ K^- \overline{K}^*(892)^0$, $\overline{K}^*(892)^0 \to K^- \pi^+$		(4.4 ±1.7) $\times 10^{-5}$			†
$K^- \pi^+ \phi$, $\phi \to K^+ K^-$		(4.0 ±1.7) $\times 10^{-5}$			422
$\phi \overline{K}^*(892)^0$, $\phi \to K^+ K^-$, $\overline{K}^*(892)^0 \to K^- \pi^+$		(1.06 ±0.20) $\times 10^{-4}$			†
$K^+ K^- K^- \pi^+$ nonresonant		(3.3 ±1.5) $\times 10^{-5}$			434
$K^0_S K^0_S K^\pm \pi^\mp$		(6.3 ±1.3) $\times 10^{-4}$			427

Pionic modes

$\pi^+ \pi^-$		(1.397±0.027) $\times 10^{-3}$			922
$\pi^0 \pi^0$		(8.0 ±0.8) $\times 10^{-4}$			923
$\pi^+ \pi^- \pi^0$		(1.44 ±0.06) %		S=1.8	907
$\rho^+ \pi^-$		(9.8 ±0.4) $\times 10^{-3}$			764
$\rho^0 \pi^0$		(3.73 ±0.22) $\times 10^{-3}$			764
$\rho^- \pi^+$		(4.97 ±0.23) $\times 10^{-3}$			764
$\rho(1450)^+ \pi^-$, $\rho(1450)^+ \to \pi^+ \pi^0$		(1.6 ±2.0) $\times 10^{-5}$			–
$\rho(1450)^0 \pi^0$, $\rho(1450)^0 \to \pi^+ \pi^-$		(4.3 ±1.9) $\times 10^{-5}$			–
$\rho(1450)^- \pi^+$, $\rho(1450)^- \to \pi^- \pi^0$		(2.6 ±0.4) $\times 10^{-4}$			–
$\rho(1700)^+ \pi^-$, $\rho(1700)^+ \to \pi^+ \pi^0$		(5.9 ±1.4) $\times 10^{-4}$			–

$\rho(1700)^0 \pi^0$, $\rho(1700)^0 \to \pi^+ \pi^-$		$(7.2 \pm 1.7) \times 10^{-4}$		–
$\rho(1700)^- \pi^+$, $\rho(1700)^- \to \pi^- \pi^0$		$(4.6 \pm 1.1) \times 10^{-4}$		–
$f_0(980) \pi^0$, $f_0(980) \to \pi^+ \pi^-$		$(3.6 \pm 0.8) \times 10^{-5}$		–
$f_0(600) \pi^0$, $f_0(600) \to \pi^+ \pi^-$		$(1.18 \pm 0.21) \times 10^{-4}$		–
$f_0(1370) \pi^0$, $f_0(1370) \to \pi^+ \pi^-$		$(5.3 \pm 2.1) \times 10^{-5}$		–
$f_0(1500) \pi^0$, $f_0(1500) \to \pi^+ \pi^-$		$(5.6 \pm 1.5) \times 10^{-5}$		–
$f_0(1710) \pi^0$, $f_0(1710) \to \pi^+ \pi^-$		$(4.5 \pm 1.5) \times 10^{-5}$		–
$f_2(1270) \pi^0$, $f_2(1270) \to \pi^+ \pi^-$		$(1.90 \pm 0.20) \times 10^{-4}$		–
$\pi^+ \pi^- \pi^0$ nonresonant		$(1.21 \pm 0.35) \times 10^{-4}$		907
$3\pi^0$		$< 3.5 \times 10^{-4}$	CL=90%	908
$2\pi^+ 2\pi^-$		$(7.44 \pm 0.21) \times 10^{-3}$	S=1.1	880
$a_1(1260)^+ \pi^-$, $a_1^+ \to \pi^+ \pi^- \pi^+$ total		$(4.47 \pm 0.31) \times 10^{-3}$		–
$a_1(1260)^+ \pi^-$, $a_1^+ \to \rho^0 \pi^+$ S-wave		$(3.22 \pm 0.25) \times 10^{-3}$		–
$a_1(1260)^+ \pi^-$, $a_1^+ \to \rho^0 \pi^+$ D-wave		$(1.9 \pm 0.5) \times 10^{-4}$		–
$a_1(1260)^+ \pi^-$, $a_1^+ \to \sigma \pi^+$		$(6.2 \pm 0.7) \times 10^{-4}$		–
$2\rho^0$ total		$(1.82 \pm 0.13) \times 10^{-3}$		518
$2\rho^0$, parallel helicities		$(8.2 \pm 3.2) \times 10^{-5}$		–
$2\rho^0$, perpendicular helicities		$(4.8 \pm 0.6) \times 10^{-4}$		–
$2\rho^0$, longitudinal helicities		$(1.25 \pm 0.10) \times 10^{-3}$		–
Resonant $(\pi^+ \pi^-) \pi^+ \pi^-$ 3-body total		$(1.49 \pm 0.12) \times 10^{-3}$		–
$\sigma \pi^+ \pi^-$		$(6.1 \pm 0.9) \times 10^{-4}$		–
$f_0(980) \pi^+ \pi^-$, $f_0 \to \pi^+ \pi^-$		$(1.8 \pm 0.5) \times 10^{-4}$		–
$f_2(1270) \pi^+ \pi^-$, $f_2 \to \pi^+ \pi^-$		$(3.6 \pm 0.6) \times 10^{-4}$		–
$\pi^+ \pi^- 2\pi^0$		(1.00 ± 0.09) %		882
$\eta \pi^0$	[l]	$(5.7 \pm 1.4) \times 10^{-4}$		846
$\omega \pi^0$	[l]	$< 2.6 \times 10^{-4}$	CL=90%	761
$2\pi^+ 2\pi^- \pi^0$		$(4.2 \pm 0.5) \times 10^{-3}$		844
$\eta \pi^+ \pi^-$	[l]	$< 1.9 \times 10^{-3}$	CL=90%	827
$\omega \pi^+ \pi^-$	[l]	$(1.6 \pm 0.5) \times 10^{-3}$		738
$3\pi^+ 3\pi^-$		$(4.2 \pm 1.2) \times 10^{-4}$		795

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

$K^+ K^-$		$(3.93 \pm 0.08) \times 10^{-3}$		791
$2K^0_S$		$(3.8 \pm 0.7) \times 10^{-4}$		789
$K^0_S K^- \pi^+$		$(3.5 \pm 0.5) \times 10^{-3}$	S=1.1	739
$\overline{K}^*(892)^0 K^0_S$, $\overline{K}^*(892)^0 \to K^- \pi^+$		$< 6 \times 10^{-4}$	CL=90%	608
$K^0_S K^+ \pi^-$		$(2.7 \pm 0.5) \times 10^{-3}$		739
$K^*(892)^0 K^0_S$, $K^*(892)^0 \to K^+ \pi^-$		$< 3.0 \times 10^{-4}$	CL=90%	608
$K^+ K^- \pi^0$		$(3.29 \pm 0.14) \times 10^{-3}$		743
$K^*(892)^+ K^-$, $K^*(892)^+ \to K^+ \pi^0$		$(1.47 \pm 0.07) \times 10^{-3}$		–
$K^*(892)^- K^+$, $K^*(892)^- \to K^- \pi^0$		$(5.1 \pm 0.5) \times 10^{-4}$		–
$(K^+ \pi^0)_{S-wave} K^-$		$(2.34 \pm 0.17) \times 10^{-3}$		743
$(K^- \pi^0)_{S-wave} K^+$		$(1.3 \pm 0.4) \times 10^{-4}$		743
$f_0(980) \pi^0$, $f_0 \to K^+ K^-$		$(3.5 \pm 0.6) \times 10^{-4}$		–
$\phi \pi^0$, $\phi \to K^+ K^-$		$(6.1 \pm 0.6) \times 10^{-4}$		–
$K^0_S K^0_S \pi^0$		$< 5.9 \times 10^{-4}$		740
$K^+ K^- \pi^+ \pi^-$	[m]	$(2.43 \pm 0.12) \times 10^{-3}$		677
$\phi \pi^+ \pi^-$ 3-body, $\phi \to K^+ K^-$		$(2.4 \pm 2.4) \times 10^{-5}$		614
$\phi \rho^0$, $\phi \to K^+ K^-$		$(7.1 \pm 0.6) \times 10^{-4}$		250
$K^+ K^- \rho^0$ 3-body		$(5 \pm 7) \times 10^{-5}$		302
$f_0(980) \pi^+ \pi^-$, $f_0 \to K^+ K^-$		$(3.6 \pm 0.9) \times 10^{-4}$		–
$K^*(892)^0 K^\mp \pi^\pm$ 3-body, $K^{*0} \to K^\pm \pi^\mp$	[n]	$(2.7 \pm 0.6) \times 10^{-4}$		531
$K^*(892)^0 \overline{K}^*(892)^0$, $K^{*0} \to K^\pm \pi^\mp$		$(7 \pm 5) \times 10^{-5}$		272
$K_1(1270)^\pm K^\mp$, $K_1(1270)^\pm \to K^\pm \pi^+ \pi^-$		$(8.0 \pm 1.8) \times 10^{-4}$		–
$K_1(1400)^\pm K^\mp$, $K_1(1400)^\pm \to K^\pm \pi^+ \pi^-$		$(5.4 \pm 1.2) \times 10^{-4}$		–
$K^0_S K^0_S \pi^+ \pi^-$		$(1.30 \pm 0.24) \times 10^{-3}$		673
$K^0_S K^- \pi^+ \pi^+ \pi^-$		$< 1.5 \times 10^{-4}$	CL=90%	595
$K^+ K^- \pi^+ \pi^- \pi^0$		$(3.1 \pm 2.0) \times 10^{-3}$		600

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

$\phi \pi^0$		$(7.6 \pm 0.5) \times 10^{-4}$		645
$\phi \eta$		$(1.4 \pm 0.5) \times 10^{-4}$		489
$\phi \omega$		$< 2.1 \times 10^{-3}$	CL=90%	238

Radiative modes

$\rho^0 \gamma$		$< 2.4 \times 10^{-4}$	CL=90%	771
$\omega \gamma$		$< 2.4 \times 10^{-4}$	CL=90%	768
$\phi \gamma$		$(2.5 \pm^{0.7}_{0.6}) \times 10^{-5}$		654
$\overline{K}^*(892)^0 \gamma$		$< 7.6 \times 10^{-4}$	CL=90%	719

Doubly Cabibbo suppressed (*DC*) modes or $\Delta C = 2$ forbidden via mixing (*C2M*) modes

$K^+ \ell^- \overline{\nu}_\ell$ via $\overline{D}^0$		$< 1.8 \times 10^{-4}$	CL=90%	–
K^+ or $K^*(892)^+ e^- \overline{\nu}_e$ via $\overline{D}^0$		$< 6 \times 10^{-5}$	CL=90%	–
$K^+ \pi^-$	*DC*	$(1.48 \pm 0.07) \times 10^{-4}$		861
$K^+ \pi^-$ via DCS		$(1.31 \pm 0.08) \times 10^{-4}$		–
$K^+ \pi^-$ via $\overline{D}^0$		$< 1.6 \times 10^{-5}$	CL=95%	861
$K^0_S \pi^+ \pi^-$ in $D^0 \to \overline{D}^0$		$< 1.9 \times 10^{-4}$	CL=95%	–
$K^*(892)^+ \pi^-$, $K^*(892)^+ \to K^0_S \pi^+$	*DC*	$(1.0 \pm^{1.3}_{0.4}) \times 10^{-4}$		711
$K^+ \pi^- \pi^0$	*DC*	$(3.05 \pm 0.17) \times 10^{-4}$		844
$K^+ \pi^- \pi^0$ via $\overline{D}^0$		$< 8 \times 10^{-5}$	CL=95%	–
$K^+ \pi^- \pi^+ \pi^-$	*DC*	$(2.62 \pm^{0.21}_{0.19}) \times 10^{-4}$		813
$K^+ \pi^- \pi^+ \pi^-$ via $\overline{D}^0$		$< 4 \times 10^{-4}$	CL=90%	812
μ^- anything via $\overline{D}^0$		$< 4 \times 10^{-4}$	CL=90%	–

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

$\gamma \gamma$	*C1*	$< 2.7 \times 10^{-5}$	CL=90%	932
$e^+ e^-$	*C1*	$< 1.2 \times 10^{-6}$	CL=90%	932
$\mu^+ \mu^-$	*C1*	$< 1.3 \times 10^{-6}$	CL=90%	926
$\pi^0 e^+ e^-$	*C1*	$< 4.5 \times 10^{-5}$	CL=90%	928
$\pi^0 \mu^+ \mu^-$	*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
$\pi^+ \pi^- e^+ e^-$	*C1*	$< 3.73 \times 10^{-4}$	CL=90%	922
$\rho^0 e^+ e^-$	*C1*	$< 1.0 \times 10^{-4}$	CL=90%	771
$\pi^+ \pi^- \mu^+ \mu^-$	*C1*	$< 3.0 \times 10^{-5}$	CL=90%	894
$\rho^0 \mu^+ \mu^-$	*C1*	$< 2.2 \times 10^{-5}$	CL=90%	754
$\omega e^+ e^-$	*C1*	$< 1.8 \times 10^{-4}$	CL=90%	768
$\omega \mu^+ \mu^-$	*C1*	$< 8.3 \times 10^{-4}$	CL=90%	751
$K^- K^+ e^+ e^-$	*C1*	$< 3.15 \times 10^{-4}$	CL=90%	791
$\phi e^+ e^-$	*C1*	$< 5.2 \times 10^{-5}$	CL=90%	654
$K^- K^+ \mu^+ \mu^-$	*C1*	$< 3.3 \times 10^{-5}$	CL=90%	710
$\phi \mu^+ \mu^-$	*C1*	$< 3.1 \times 10^{-5}$	CL=90%	631
$\overline{K}^0 e^+ e^-$	[f]	$< 1.1 \times 10^{-4}$	CL=90%	866

$\overline{K}^0 \mu^+ \mu^-$		[f]	< 2.6	$\times 10^{-4}$	CL=90%	852
$K^- \pi^+ e^+ e^-$	C1		< 3.85	$\times 10^{-4}$	CL=90%	861
$\overline{K}^*(892)^0 e^+ e^-$		[f]	< 4.7	$\times 10^{-5}$	CL=90%	719
$K^- \pi^+ \mu^+ \mu^-$	C1		< 3.59	$\times 10^{-4}$	CL=90%	829
$\overline{K}^*(892)^0 \mu^+ \mu^-$		[f]	< 2.4	$\times 10^{-5}$	CL=90%	700
$\pi^+ \pi^- \pi^0 \mu^+ \mu^-$	C1		< 8.1	$\times 10^{-4}$	CL=90%	863
$\mu^\pm e^\mp$	LF	[g]	< 8.1	$\times 10^{-7}$	CL=90%	929
$\pi^0 e^\pm \mu^\mp$	LF	[g]	< 8.6	$\times 10^{-5}$	CL=90%	924
$\eta e^\pm \mu^\mp$	LF	[g]	< 1.0	$\times 10^{-4}$	CL=90%	848
$\pi^+ \pi^- e^\pm \mu^\mp$	LF	[g]	< 1.5	$\times 10^{-5}$	CL=90%	911
$\rho^0 e^\pm \mu^\mp$	LF	[g]	< 4.9	$\times 10^{-5}$	CL=90%	767
$\omega e^\pm \mu^\mp$	LF	[g]	< 1.2	$\times 10^{-4}$	CL=90%	764
$K^- K^+ e^\pm \mu^\mp$	LF	[g]	< 1.8	$\times 10^{-4}$	CL=90%	754
$\phi e^\pm \mu^\mp$	LF	[g]	< 3.4	$\times 10^{-5}$	CL=90%	648
$\overline{K}^0 e^\pm \mu^\mp$	LF	[g]	< 1.0	$\times 10^{-4}$	CL=90%	863
$K^- \pi^+ e^\pm \mu^\mp$	LF	[g]	< 5.53	$\times 10^{-4}$	CL=90%	848
$\overline{K}^*(892)^0 e^\pm \mu^\mp$	LF	[g]	< 8.3	$\times 10^{-5}$	CL=90%	714
$\pi^- \pi^- e^+ e^+ +$ c.c.	L		< 1.12	$\times 10^{-4}$	CL=90%	922
$\pi^- \pi^- \mu^+ \mu^+ +$ c.c.	L		< 2.9	$\times 10^{-5}$	CL=90%	894
$K^- \pi^- e^+ e^+ +$ c.c.	L		< 2.06	$\times 10^{-4}$	CL=90%	861
$K^- \pi^- \mu^+ \mu^+ +$ c.c.	L		< 3.9	$\times 10^{-4}$	CL=90%	829
$K^- K^- e^+ e^+ +$ c.c.	L		< 1.52	$\times 10^{-4}$	CL=90%	791
$K^- K^- \mu^+ \mu^+ +$ c.c.	L		< 9.4	$\times 10^{-5}$	CL=90%	710
$\pi^- \pi^- e^+ \mu^+ +$ c.c.	L		< 7.9	$\times 10^{-5}$	CL=90%	911
$K^- \pi^- e^+ \mu^+ +$ c.c.	L		< 2.18	$\times 10^{-4}$	CL=90%	848
$K^- K^- e^+ \mu^+ +$ c.c.	L		< 5.7	$\times 10^{-5}$	CL=90%	754

$D^*(2007)^0$

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

Mass $m = 2006.97 \pm 0.19$ 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 $m = 2010.27 \pm 0.17$ MeV (S = 1.1)
$m_{D^*(2010)^+} - m_{D^+} = 140.64 \pm 0.10$ MeV (S = 1.1)
$m_{D^*(2010)^+} - m_{D^0} = 145.421 \pm 0.010$ MeV (S = 1.1)
Full width $\Gamma = 96 \pm 22$ keV

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

$D^*(2010)^\pm$ DECAY MODES	Fraction (Γ_i/Γ)	p (MeV/c)
$D^0\pi^+$	(67.7±0.5) %	39
$D^+\pi^0$	(30.7±0.5) %	38
$D^+\gamma$	(1.6±0.4) %	136

$D_1(2420)^0$

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

Mass $m = 2422.3 \pm 1.3$ MeV (S = 1.2)
$m_{D_1^0} - m_{D^{*+}} = 411.7 \pm 0.8$
Full width $\Gamma = 20.4 \pm 1.7$ 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
$D^0\pi^+\pi^-$	seen	426
$D^+\pi^-$	not seen	474
$D^{*0}\pi^+\pi^-$	not seen	281

$D_2^*(2460)^0$

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

$J^P = 2^+$ assignment strongly favored.

Mass $m = 2461.1 \pm 1.6$ MeV (S = 1.3)
$m_{D_2^{*0}} - m_{D^+} = 593.9 \pm 0.8$
Full width $\Gamma = 43 \pm 4$ MeV (S = 1.8)

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

$D_2^*(2460)^0$ DECAY MODES	Fraction (Γ_i/Γ)	p (MeV/c)
$D^+\pi^-$	seen	505
$D^*(2010)^+\pi^-$	seen	389
$D^0\pi^+\pi^-$	not seen	462
$D^{*0}\pi^+\pi^-$	not seen	324

$D_2^*(2460)^\pm$

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

$J^P = 2^+$ assignment strongly favored.

Mass $m = 2460.1^{+2.6}_{-3.5}$ MeV (S = 1.5)
$m_{D_2^*(2460)^\pm} - m_{D_2^*(2460)^0} = 2.4 \pm 1.7$ MeV
Full width $\Gamma = 37 \pm 6$ MeV (S = 1.4)

$D_2^*(2460)^-$ 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	391
$D^+\pi^+\pi^-$	not seen	457
$D^{*+}\pi^+\pi^-$	not seen	320

NOTES

[*a*] This result applies to $Z^0 \rightarrow c\overline{c}$ decays only. Here ℓ^+ is an average (not a sum) of e^+ and μ^+ decays.

[*b*] 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 in the Particle Listings.

[*c*] These subfractions of the $K^-\pi^+\pi^+$ mode are uncertain: see the Particle Listings.

[*d*] The two experiments measuring this fraction are in serious disagreement. See the Particle Listings.

[*e*] This is *not* a test for the ΔC=1 weak neutral current, but leads to the $\pi^+e^+e^-$ final state.

[*f*] This mode is not a useful test for a ΔC=1 weak neutral current because both quarks must change flavor in this decay.

[*g*] The value is for the sum of the charge states or particle/antiparticle states indicated.

[*h*] This value is obtained by subtracting the branching fractions for 2-, 4- and 6-prongs from unity.

[*i*] This is the sum of our $K^-\pi^+\pi^+\pi^-$, $K^-\pi^+\pi^+\pi^-\pi^0$, $\overline{K}^0 2\pi^+2\pi^-$, $2\pi^+2\pi^-$, $2\pi^+2\pi^-\pi^0$, $K^+K^-\pi^+\pi^-$, and $K^+K^-\pi^+\pi^-\pi^0$, branching fractions.

[*j*] The branching fractions for the $K^-e^+\nu_e$, $K^*(892)^-e^+\nu_e$, $\pi^-e^+\nu_e$, and $\rho^-e^+\nu_e$ modes add up to 6.24 $\pm$ 0.18 %.

[*k*] This is a doubly Cabibbo-suppressed mode.

[*l*] This branching fraction includes all the decay modes of the resonance in the final state.

[*m*] 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.

[*n*] However, these upper limits are in serious disagreement with values obtained in another experiment.