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 $m = 1869.57 \pm 0.16$ 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

$A_{CP}(\mu^\pm\nu) = (8 \pm 8)\%$
$A_{CP}(K^0_S\pi^\pm) = (-0.80 \pm 0.26)\%$
$A_{CP}(K^\mp 2\pi^\pm) = (-0.1 \pm 1.0)\%$
$A_{CP}(K^\mp\pi^\pm\pi^\pm\pi^0) = (1.0 \pm 1.3)\%$
$A_{CP}(K^0_S\pi^\pm\pi^0) = (0.3 \pm 0.9)\%$
$A_{CP}(K^0_S\pi^\pm\pi^+\pi^-) = (0.1 \pm 1.3)\%$
$A_{CP}(\pi^\pm\pi^0) = (2.9 \pm 2.9)\%$
$A_{CP}(\pi^\pm\eta) = (-2.0 \pm 2.3)\%$
$A_{CP}(\pi^\pm\eta'(958)) = (-4.0 \pm 3.4)\%$
$A_{CP}(K^0_S K^\pm) = (-0.1 \pm 0.6)\%$
$A_{CP}(K^+K^-\pi^\pm) = (0.3 \pm 0.6)\%$
$A_{CP}(K^\pm K^{*0}) = (0.1 \pm 1.3)\%$
$A_{CP}(\phi\pi^\pm) = (-0.9 \pm 1.1)\%$
$A_{CP}(K^\pm K^*_0(1430)^0) = (8^{+7}_{-6})\%$
$A_{CP}(K^\pm K^*_2(1430)^0) = (43^{+20}_{-26})\%$
$A_{CP}(K^\pm K^*_0(800)) = (-12^{+18}_{-13})\%$
$A_{CP}(a_0(1450)^0\pi^\pm) = (-19^{+14}_{-16})\%$
$A_{CP}(\phi(1680)\pi^\pm) = (-9 \pm 26)\%$
$A_{CP}(\pi^+\pi^-\pi^\pm) = (-2 \pm 4)\%$
$A_{CP}(K^0_S K^\pm\pi^+\pi^-) = (-4 \pm 7)\%$
$A_{CP}(K^\pm\pi^0) = (-4 \pm 11)\%$

T-violation decay-rate asymmetry

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

D^+ form factors

$f_+(0)|V_{cs}|$ in $\overline{K}^0 \ell^+ \nu_\ell = 0.707 \pm 0.013$
$r_1 \equiv a_1/a_0$ in $\overline{K}^0 \ell^+ \nu_\ell = -1.7 \pm 0.5$
$r_2 \equiv a_2/a_0$ in $\overline{K}^0 \ell^+ \nu_\ell = -14 \pm 11$
$f_+(0)|V_{cd}|$ in $\pi^0 \ell^+ \nu_\ell = 0.146 \pm 0.007$
$r_1 \equiv a_1/a_0$ in $\pi^0 \ell^+ \nu_\ell = -1.4 \pm 0.9$
$r_2 \equiv a_2/a_0$ in $\pi^0 \ell^+ \nu_\ell = -4 \pm 5$
$r_v \equiv V(0)/A_1(0)$ in $\overline{K}^*(892)^0 \ell^+ \nu_\ell = 1.62 \pm 0.08$ (S = 1.5)
$r_2 \equiv A_2(0)/A_1(0)$ in $\overline{K}^*(892)^0 \ell^+ \nu_\ell = 0.83 \pm 0.05$
$r_3 \equiv A_3(0)/A_1(0)$ in $\overline{K}^*(892)^0 \ell^+ \nu_\ell = 0.0 \pm 0.4$
Γ_L/Γ_T in $\overline{K}^*(892)^0 \ell^+ \nu_\ell = 1.13 \pm 0.08$
Γ_+/Γ_- in $\overline{K}^*(892)^0 \ell^+ \nu_\ell = 0.22 \pm 0.06$ (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^+ semileptonic	(16.07±0.30) %		–
μ^+ anything	(17.6 ±3.2) %		–
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			
$e^+ \nu_e$	< 8.8 $\times 10^{-6}$	CL=90%	935
$\mu^+ \nu_\mu$	(3.82±0.33) $\times 10^{-4}$		932
$\tau^+ \nu_\tau$	< 1.2 $\times 10^{-3}$	CL=90%	90
$\overline{K}^0 e^+ \nu_e$	(8.83±0.22) %		869
$\overline{K}^0 \mu^+ \nu_\mu$	(9.2 ±0.6) %		865
$K^- \pi^+ e^+ \nu_e$	(3.5 $^{+0.7}_{-0.6}$) %		864
$\overline{K}^*(892)^0 e^+ \nu_e$, $\overline{K}^*(892)^0 \to K^- \pi^+$	(3.68±0.21) %		722

$K^-\pi^+e^+\nu_e$ nonresonant	$<$ 7	$\times 10^{-3}$	CL=90%	864
$K^-\pi^+\mu^+\nu_\mu$	(3.8 $\pm$0.4) %			851
$\overline{K}^*(892)^0\mu^+\nu_\mu$, $\overline{K}^*(892)^0 \to K^-\pi^+$	(3.7 $\pm$0.3) %			717
$K^-\pi^+\mu^+\nu_\mu$ nonresonant	(2.0 $\pm$0.5)	$\times 10^{-3}$		851
$K^-\pi^+\pi^0\mu^+\nu_\mu$	$<$ 1.6	$\times 10^{-3}$	CL=90%	825
$\pi^0e^+\nu_e$	(4.05$\pm$0.18)	$\times 10^{-3}$		930
$\eta e^+\nu_e$	(1.33$\pm$0.21)	$\times 10^{-3}$		855
$\rho^0e^+\nu_e$	(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
$\eta'(958)e^+\nu_e$	$<$ 3.5	$\times 10^{-4}$	CL=90%	689
$\phi e^+\nu_e$	$<$ 1.6	$\times 10^{-4}$	CL=90%	657

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

$\overline{K}^*(892)^0e^+\nu_e$	(5.53$\pm$0.13) %			722
$\overline{K}^*(892)^0\mu^+\nu_\mu$	(5.28$\pm$0.15) %			717
$\overline{K}_0^*(1430)^0\mu^+\nu_\mu$	$<$ 2.4	$\times 10^{-4}$		380
$\overline{K}^*(1680)^0\mu^+\nu_\mu$	$<$ 1.5	$\times 10^{-3}$		105

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

$K_S^0\pi^+$	(1.47$\pm$0.07) %		S=2.0	863
$K_L^0\pi^+$	(1.46$\pm$0.05) %			863
$K^-2\pi^+$	[c] (9.13$\pm$0.19) %		S=1.1	846
$(K^-\pi^+)_{S-\text{wave}}\pi^+$	(7.31$\pm$0.19) %			846
$\overline{K}_0^*(1430)^0\pi^+$, $\overline{K}_0^*(1430)^0 \to K^-\pi^+$	[d] (1.21$\pm$0.06) %			382
$\overline{K}^*(892)^0\pi^+$, $\overline{K}^*(892)^0 \to K^-\pi^+$	(1.01$\pm$0.11) %			714
$\overline{K}^*(1410)^0\pi^+$, $\overline{K}^{*0} \to K^-\pi^+$	not seen			381
$\overline{K}_2^*(1430)^0\pi^+$, $\overline{K}_2^*(1430)^0 \to K^-\pi^+$	[d] (2.2 $\pm$0.7)	$\times 10^{-4}$		371
$\overline{K}^*(1680)^0\pi^+$, $\overline{K}^*(1680)^0 \to K^-\pi^+$	[d] (2.1 $\pm$1.1)	$\times 10^{-4}$		58
$K^-(2\pi^+)_{I=2}$	(1.41$\pm$0.26) %			–
$K_S^0\pi^+\pi^0$	[c] (6.99$\pm$0.27) %			845
$K_S^0\rho^+$	(4.8 $\pm$1.0) %			677
$\overline{K}^*(892)^0\pi^+$, $\overline{K}^*(892)^0 \to K_S^0\pi^0$	(1.3 $\pm$0.6) %			714
$K_S^0\pi^+\pi^0$ nonresonant	(9 $\pm$7)	$\times 10^{-3}$		845

$K^- 2\pi^+ \pi^0$	[e]	(5.99±0.18) %		816
$K^0_S 2\pi^+ \pi^-$	[e]	(3.12±0.11) %		814
$K^- 3\pi^+ \pi^-$	[c]	(5.6 ±0.5) × 10^{-3}	S=1.1	772
$\overline{K}^*(892)^0 2\pi^+ \pi^-$,		(1.2 ±0.4) × 10^{-3}		645
$\overline{K}^*(892)^0 \to K^- \pi^+$				
$\overline{K}^*(892)^0 \rho^0 \pi^+$,		(2.2 ±0.4) × 10^{-3}		239
$\overline{K}^*(892)^0 \to K^- \pi^+$				
$\overline{K}^*(892)^0 a_1(1260)^+$	[f]	(9.0 ±1.8) × 10^{-3}		†
$K^- \rho^0 2\pi^+$		(1.68±0.27) × 10^{-3}		524
$K^- 3\pi^+ \pi^-$ nonresonant		(3.9 ±2.9) × 10^{-4}		772
$K^+ 2K^0_S$		(4.5 ±2.0) × 10^{-3}		545
$K^+ K^- K^0_S \pi^+$		(2.4 ±0.6) × 10^{-4}		436

Pionic modes

$\pi^+ \pi^0$		(1.19±0.06) × 10^{-3}		925
$2\pi^+ \pi^-$		(3.18±0.18) × 10^{-3}		908
$\rho^0 \pi^+$		(8.1 ±1.5) × 10^{-4}		767
$\pi^+ (\pi^+ \pi^-)_{S-\text{wave}}$		(1.78±0.16) × 10^{-3}		908
$\sigma \pi^+$, $\sigma \to \pi^+ \pi^-$		(1.34±0.12) × 10^{-3}		–
$f_0(980) \pi^+$,		(1.52±0.33) × 10^{-4}		669
$f_0(980) \to \pi^+ \pi^-$				
$f_0(1370) \pi^+$,		(8 ±4) × 10^{-5}		–
$f_0(1370) \to \pi^+ \pi^-$				
$f_2(1270) \pi^+$,		(4.9 ±0.9) × 10^{-4}		485
$f_2(1270) \to \pi^+ \pi^-$				
$\rho(1450)^0 \pi^+$,		< 8 × 10^{-5}	CL=95%	338
$\rho(1450)^0 \to \pi^+ \pi^-$				
$f_0(1500) \pi^+$,		(1.1 ±0.4) × 10^{-4}		–
$f_0(1500) \to \pi^+ \pi^-$				
$f_0(1710) \pi^+$,		< 5 × 10^{-5}	CL=95%	–
$f_0(1710) \to \pi^+ \pi^-$				
$f_0(1790) \pi^+$,		< 6 × 10^{-5}	CL=95%	–
$f_0(1790) \to \pi^+ \pi^-$				
$(\pi^+ \pi^+)_{S-\text{wave}} \pi^-$		< 1.2 × 10^{-4}	CL=95%	908
$2\pi^+ \pi^-$ nonresonant		< 1.1 × 10^{-4}	CL=95%	908
$\pi^+ 2\pi^0$		(4.6 ±0.4) × 10^{-3}		910
$2\pi^+ \pi^- \pi^0$		(1.13±0.08) %		883
$\eta \pi^+$, $\eta \to \pi^+ \pi^- \pi^0$		(7.8 ±0.5) × 10^{-4}		848
$\omega \pi^+$, $\omega \to \pi^+ \pi^- \pi^0$		< 3 × 10^{-4}	CL=90%	763
$3\pi^+ 2\pi^-$		(1.61±0.16) × 10^{-3}		845

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

$\eta\pi^+$		$(\ 3.53\pm0.21)\times10^{-3}$		848
$\eta\pi^+\pi^0$		$(\ 1.38\pm0.35)\times10^{-3}$		830
$\omega\pi^+$		$<\ 3.4\ \times10^{-4}$	CL=90%	764
$\eta'(958)\pi^+$		$(\ 4.67\pm0.29)\times10^{-3}$		680
$\eta'(958)\pi^+\pi^0$		$(\ 1.6\ \pm0.5\ )\times10^{-3}$		654

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

$K^+K^0_S$		$(\ 2.83\pm0.16)\times10^{-3}$	S=2.2	793
$K^+K^-\pi^+$	[c]	$(\ 9.54\pm0.26)\times10^{-3}$	S=1.1	744
$\phi\pi^+,\ \phi\to\ K^+K^-$		$(\ 2.65^{+0.08}_{-0.09})\times10^{-3}$		647
$K^+\overline{K}^*(892)^0,$ $\overline{K}^*(892)^0\to\ K^-\pi^+$		$(\ 2.45^{+0.09}_{-0.14})\times10^{-3}$		613
$K^+\overline{K}^*_0(1430)^0,$ $\overline{K}^*_0(1430)^0\to\ K^-\pi^+$		$(\ 1.79\pm0.34)\times10^{-3}$		–
$K^+\overline{K}^*_2(1430)^0,\ \overline{K}^*_2\to$ $K^-\pi^+$		$(\ 1.6\ ^{+1.2}_{-0.8}\ )\times10^{-4}$		–
$K^+\overline{K}^*_0(800),\ \overline{K}^*_0\to\ K^-\pi^+$		$(\ 6.7\ ^{+3.4}_{-2.1}\ )\times10^{-4}$		–
$a_0(1450)^0\pi^+,\ a^0_0\to$ K^+K^-		$(\ 4.4\ ^{+7.0}_{-1.8}\ )\times10^{-4}$		–
$\phi(1680)\pi^+,\ \phi\to\ K^+K^-$		$(\ 4.9\ ^{+4.0}_{-1.9}\ )\times10^{-5}$		–
$K^+K^-\pi^+$ nonresonant		not seen		744
$K^+K^0_S\pi^+\pi^-$		$(\ 1.75\pm0.18)\times10^{-3}$		678
$K^0_SK^-2\pi^+$		$(\ 2.40\pm0.18)\times10^{-3}$		678
$K^+K^-2\pi^+\pi^-$		$(\ 2.2\ \pm1.2\ )\times10^{-4}$		600

A few poorly measured branching fractions:

$\phi\pi^+\pi^0$		$(\ 2.3\ \pm1.0\ )\%$		619
$\phi\rho^+$		$<\ 1.5\ \%$	CL=90%	259
$K^+K^-\pi^+\pi^0$ non-ϕ		$(\ 1.5\ ^{+0.7}_{-0.6}\ )\%$		682
$K^*(892)^+K^0_S$		$(\ 1.6\ \pm0.7\ )\%$		611

Doubly Cabibbo-suppressed modes

$K^+\pi^0$		$(\ 1.83\pm0.26)\times10^{-4}$	S=1.4	864
$K^+\eta$		$<\ 1.4\ \times10^{-4}$	CL=90%	776
$K^+\eta'(958)$		$<\ 1.8\ \times10^{-4}$	CL=90%	571
$K^+\pi^+\pi^-$		$(\ 5.27\pm0.23)\times10^{-4}$		846
$K^+\rho^0$		$(\ 2.0\ \pm0.5\ )\times10^{-4}$		679

$K^*(892)^0\pi^+$, $K^*(892)^0 \to K^+\pi^-$	$(\ 2.5\ \pm 0.4\ ) \times 10^{-4}$		714
$K^+ f_0(980)$, $f_0(980) \to \pi^+\pi^-$	$(\ 4.7\ \pm 2.8\ ) \times 10^{-5}$		–
$K_2^*(1430)^0\pi^+$, $K_2^*(1430)^0 \to K^+\pi^-$	$(\ 4.2\ \pm 2.8\ ) \times 10^{-5}$		–
$K^+\pi^+\pi^-$ nonresonant	not seen		846
$2K^+K^-$	$(\ 8.7\ \pm 2.0\ ) \times 10^{-5}$		550

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

$\pi^+ e^+ e^-$	$C1$		< 5.9	$\times 10^{-6}$	CL=90%	930
$\pi^+\phi$, $\phi \to e^+e^-$		[g]	$(\ 1.7\ ^{+1.4}_{-0.9}\ ) \times 10^{-6}$			–
$\pi^+\mu^+\mu^-$	$C1$		< 3.9	$\times 10^{-6}$	CL=90%	917
$\pi^+\phi$, $\phi \to \mu^+\mu^-$		[g]	$(\ 1.8\ \pm 0.8\ ) \times 10^{-6}$			–
$\rho^+\mu^+\mu^-$	$C1$		< 5.6	$\times 10^{-4}$	CL=90%	757
$K^+ e^+ e^-$		[h]	< 3.0	$\times 10^{-6}$	CL=90%	870
$K^+\mu^+\mu^-$		[h]	< 9.2	$\times 10^{-6}$	CL=90%	856
$\pi^+ e^\pm \mu^\mp$	LF	[i]	< 3.4	$\times 10^{-5}$	CL=90%	927
$K^+ e^\pm \mu^\mp$	LF	[i]	< 6.8	$\times 10^{-5}$	CL=90%	866
$\pi^- 2e^+$	L		< 1.1	$\times 10^{-6}$	CL=90%	930
$\pi^- 2\mu^+$	L		< 4.8	$\times 10^{-6}$	CL=90%	917
$\pi^- e^+\mu^+$	L		< 5.0	$\times 10^{-5}$	CL=90%	927
$\rho^- 2\mu^+$	L		< 5.6	$\times 10^{-4}$	CL=90%	757
$K^- 2e^+$	L		< 3.5	$\times 10^{-6}$	CL=90%	870
$K^- 2\mu^+$	L		< 1.3	$\times 10^{-5}$	CL=90%	856
$K^- e^+\mu^+$	L		< 1.3	$\times 10^{-4}$	CL=90%	866
$K^*(892)^- 2\mu^+$	L		< 8.5	$\times 10^{-4}$	CL=90%	703

D^0

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

Mass $m = 1864.80 \pm 0.14$ MeV
$m_{D^\pm} - m_{D^0} = 4.77 \pm 0.10$ MeV (S = 1.1)
Mean life $\tau = (410.1 \pm 1.5) \times 10^{-15}$ s
$c\tau = 122.9\ \mu$m
$|m_{D_1^0} - m_{D_2^0}| = (2.39^{+0.59}_{-0.63}) \times 10^{10}\ \hbar\ \text{s}^{-1}$ [j]
$(\Gamma_{D_1^0} - \Gamma_{D_2^0})/\Gamma = 2y = (1.66 \pm 0.32) \times 10^{-2}$ [j]
$|q/p| = 0.86^{+0.18}_{-0.15}$
$A_\Gamma = (1.4 \pm 2.7) \times 10^{-3}$
$K^+\pi^-$ relative strong phase: $\cos\delta = 1.03^{+0.32}_{-0.18}$
$K^-\pi^+\pi^0$ coherence factor $R_{K\pi\pi^0} = 0.78^{+0.11}_{-0.25}$
$K^-\pi^+\pi^0$ average relative strong phase $\delta^{K\pi\pi^0} = (239^{+32}_{-28})^\circ$

$K^-\pi^-2\pi^+$ coherence factor $R_{K3\pi} = 0.36^{+0.24}_{-0.30}$

$K^-\pi^-2\pi^+$ average relative strong phase $\delta^{K3\pi} = (118^{+60}_{-50})^\circ$

CP-violation decay-rate asymmetries (labeled by the D^0 decay)

$A_{CP}(K^+K^-) = (-0.17 \pm 0.31)\%$ (S = 1.3)

$A_{CP}(2K^0_S) = (-23 \pm 19)\%$

$A_{CP}(\pi^+\pi^-) = (0.2 \pm 0.4)\%$

$A_{CP}(2\pi^0) = (0 \pm 5)\%$

$A_{CP}(\pi^+\pi^-\pi^0) = (0.3 \pm 0.4)\%$

$A_{CP}(\rho(770)^+\pi^- \to \pi^+\pi^-\pi^0) = (1.2 \pm 0.9)\%$

$A_{CP}(\rho(770)^0\pi^0 \to \pi^+\pi^-\pi^0) = (-3.1 \pm 3.0)\%$

$A_{CP}(\rho(770)^-\pi^+ \to \pi^+\pi^-\pi^0) = (-1.0 \pm 1.7)\%$

$A_{CP}(\rho(1450)^+\pi^- \to \pi^+\pi^-\pi^0) = (0 \pm 70)\%$

$A_{CP}(\rho(1450)^0\pi^0 \to \pi^+\pi^-\pi^0) = (-17 \pm 40)\%$

$A_{CP}(\rho(1450)^-\pi^+ \to \pi^+\pi^-\pi^0) = (6 \pm 9)\%$

$A_{CP}(\rho(1700)^+\pi^- \to \pi^+\pi^-\pi^0) = (-5 \pm 14)\%$

$A_{CP}(\rho(1700)^0\pi^0 \to \pi^+\pi^-\pi^0) = (13 \pm 9)\%$

$A_{CP}(\rho(1700)^-\pi^+ \to \pi^+\pi^-\pi^0) = (8 \pm 11)\%$

$A_{CP}(f_0(980)\pi^0 \to \pi^+\pi^-\pi^0) = (0 \pm 35)\%$

$A_{CP}(f_0(1370)\pi^0 \to \pi^+\pi^-\pi^0) = (25 \pm 18)\%$

$A_{CP}(f_0(1500)\pi^0 \to \pi^+\pi^-\pi^0) = (0 \pm 18)\%$

$A_{CP}(f_0(1710)\pi^0 \to \pi^+\pi^-\pi^0) = (0 \pm 24)\%$

$A_{CP}(f_2(1270)\pi^0 \to \pi^+\pi^-\pi^0) = (-4 \pm 6)\%$

$A_{CP}(\sigma(400)\pi^0 \to \pi^+\pi^-\pi^0) = (6 \pm 8)\%$

$A_{CP}(\text{nonresonant } \pi^+\pi^-\pi^0) = (-13 \pm 23)\%$

$A_{CP}(K^+K^-\pi^0) = (-1.0 \pm 1.7)\%$

$A_{CP}(K^*(892)^+K^- \to K^+K^-\pi^0) = (-0.9 \pm 1.3)\%$

$A_{CP}(K^*(1410)^+K^- \to K^+K^-\pi^0) = (-21 \pm 24)\%$

$A_{CP}((K^+\pi^0)_{S-wave}K^- \to K^+K^-\pi^0) = (7 \pm 15)\%$

$A_{CP}(\phi(1020)\pi^0 \to K^+K^-\pi^0) = (1.1 \pm 2.2)\%$

$A_{CP}(f_0(980)\pi^0 \to K^+K^-\pi^0) = (-3 \pm 19)\%$

$A_{CP}(a_0(980)^0\pi^0 \to K^+K^-\pi^0) = (-5 \pm 16)\%$

$A_{CP}(f'_2(1525)\pi^0 \to K^+K^-\pi^0) = (0 \pm 160)\%$

$A_{CP}(K^*(892)^-K^+ \to K^+K^-\pi^0) = (-5 \pm 4)\%$

$A_{CP}(K^*(1410)^-K^+ \to K^+K^-\pi^0) = (-17 \pm 29)\%$

$A_{CP}((K^-\pi^0)_{S-wave}K^+ \to K^+K^-\pi^0) = (-7 \pm 40)\%$

$A_{CP}(K^0_S\phi) = (-3 \pm 9)\%$

$A_{CP}(K^0_S\pi^0) = (0.1 \pm 1.3)\%$

$A_{CP}(K^-\pi^+) = (0.1 \pm 0.7)\%$

$A_{CP}(K^+\pi^-) = (2.2 \pm 3.2)\%$

$A_{CP}(K^-\pi^+\pi^0) = (0.2 \pm 0.9)\%$

$A_{CP}(K^+\pi^-\pi^0) = (0 \pm 5)\%$

$A_{CP}(K^0_S\pi^+\pi^-) = (-0.9^{+2.6}_{-6.0})\%$
$A_{CP}(K^*(892)^-\pi^+ \to\ K^0_S\pi^+\pi^-) <\ 3.5\times10^{-4}$, CL = 95%
$A_{CP}(K^*(892)^+\pi^- \to\ K^0_S\pi^+\pi^-) <\ 7.8\times10^{-4}$, CL = 95%
$A_{CP}(\overline{K}^0\rho^0 \to\ K^0_S\pi^+\pi^-) <\ 4.8\times10^{-4}$, CL = 95%
$A_{CP}(\overline{K}^0\omega \to\ K^0_S\pi^+\pi^-) <\ 9.2\times10^{-4}$, CL = 95%
$A_{CP}(\overline{K}^0 f_0(980) \to\ K^0_S\pi^+\pi^-) <\ 6.8\times10^{-4}$, CL = 95%
$A_{CP}(\overline{K}^0 f_2(1270) \to\ K^0_S\pi^+\pi^-) <\ 13.5\times10^{-4}$, CL = 95%
$A_{CP}(\overline{K}^0 f_0(1370) \to\ K^0_S\pi^+\pi^-) <\ 25.5\times10^{-4}$, CL = 95%
$A_{CP}(K^*_0(1430)^-\pi^+ \to\ K^0_S\pi^+\pi^-) <\ 9.0\times10^{-4}$, CL = 95%
$A_{CP}(K^*_2(1430)^-\pi^+ \to\ K^0_S\pi^+\pi^-) <\ 6.5\times10^{-4}$, CL = 95%
$A_{CP}(K^*(1680)^-\pi^+ \to\ K^0_S\pi^+\pi^-) <\ 28.4\times10^{-4}$, CL = 95%
$A_{CP}(K^-\pi^+\pi^+\pi^-) = (0.7\pm1.0)\%$
$A_{CP}(K^+\pi^-\pi^+\pi^-) = (-2\pm4)\%$
$A_{CP}(K^+K^-\pi^+\pi^-) = (-8\pm7)\%$

T-violation decay-rate asymmetry

$A_T(K^+K^-\pi^+\pi^-) = (1\pm7)\times10^{-3}$ [b]

CPT-violation decay-rate asymmetry

$A_{CPT}(K^\mp\pi^\pm) = 0.008\pm0.008$

Form factors

$r_V \equiv V(0)/A_1(0)$ in $D^0 \to\ K^*(892)^-\ell^+\nu_\ell = 1.7\pm0.8$
$r_2 \equiv A_2(0)/A_1(0)$ in $D^0 \to\ K^*(892)^-\ell^+\nu_\ell = 0.9\pm0.4$
$f_+(0)\left|V_{cs}\right|$ in $D^0 \to\ K^-\ell^+\nu_\ell = 0.726\pm0.009$
$r_1 \equiv a_1/a_0$ in $D^0 \to\ K^-\ell^+\nu_\ell = -2.65\pm0.35$
$r_2 \equiv a_1/a_0$ in $D^0 \to\ K^-\ell^+\nu_\ell = 13\pm9$
$f_+(0)\left|V_{cd}\right|$ in $D^0 \to\ \pi^-\ell^+\nu_\ell = 0.152\pm0.005$
$r_1 \equiv a_1/a_0$ in $D^0 \to\ \pi^-\ell^+\nu_\ell = -2.8\pm0.5$
$r_2 \equiv a_1/a_0$ in $D^0 \to\ \pi^-\ell^+\nu_\ell = 6\pm3.0$

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^0 DECAY MODES	Fraction (Γ_i/Γ)	Scale factor/ Confidence level	p (MeV/c)
Topological modes			
0-prongs	[k] (17 ± 6) %		–
2-prongs	(69 ± 6) %		–
4-prongs	[l] (14.3 ± 0.5) %		–
6-prongs	[m] (6.4 ± 1.3) $\times 10^{-4}$		–
Inclusive modes			
e^+ anything	[n] (6.49 ± 0.11) %		–
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			
$K^- e^+ \nu_e$	(3.55 ± 0.04) %	S=1.1	867
$K^- \mu^+ \nu_\mu$	(3.30 ± 0.13) %		864
$K^*(892)^- e^+ \nu_e$	(2.16 ± 0.16) %		719
$K^*(892)^- \mu^+ \nu_\mu$	(1.90 ± 0.23) %		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 $^{+\ 4.0}_{-\ 3.1}$) $\times 10^{-4}$		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
$\pi^- e^+ \nu_e$	(2.89 ± 0.08) $\times 10^{-3}$	S=1.1	927
$\pi^- \mu^+ \nu_\mu$	(2.37 ± 0.24) $\times 10^{-3}$		924
$\rho^- e^+ \nu_e$	(1.9 ± 0.4) $\times 10^{-3}$		771

Hadronic modes with one $\overline{K}$

$K^-\pi^+$		$(\ 3.87 \pm 0.05\ )\ \%$	S=1.2	861
$K^0_S\pi^0$		$(\ 1.19 \pm 0.05\ )\ \%$	S=1.3	860
$K^0_L\pi^0$		$(10.0 \pm 0.7\ ) \times 10^{-3}$		860
$K^0_S\pi^+\pi^-$	[c]	$(\ 2.81 \pm 0.15\ )\ \%$	S=1.1	842
$K^0_S\rho^0$		$(\ 6.3\ ^{+\ 0.6}_{-\ 0.7}\ ) \times 10^{-3}$		674
$K^0_S\omega,\ \omega \to \pi^+\pi^-$		$(\ 2.0 \pm 0.6\ ) \times 10^{-4}$		670
$K^0_S(\pi^+\pi^-)_{S-\text{wave}}$		$(\ 3.3 \pm 0.8\ ) \times 10^{-3}$		842
$K^0_S f_0(980),\ f_0(980) \to \pi^+\pi^-$		$(\ 1.21\ ^{+\ 0.40}_{-\ 0.23}\ ) \times 10^{-3}$		549
$K^0_S f_0(1370),\ f_0(1370) \to \pi^+\pi^-$		$(\ 2.8\ ^{+\ 0.9}_{-\ 1.3}\ ) \times 10^{-3}$		†
$K^0_S f_2(1270),\ f_2(1270) \to \pi^+\pi^-$		$(\ 9\ ^{+10}_{-\ 6}\ ) \times 10^{-5}$		262
$K^*(892)^-\pi^+,\ K^*(892)^- \to K^0_S\pi^-$		$(\ 1.65\ ^{+\ 0.13}_{-\ 0.16}\ )\ \%$		711
$K^*_0(1430)^-\pi^+,\ K^*_0(1430)^- \to K^0_S\pi^-$		$(\ 2.69\ ^{+\ 0.40}_{-\ 0.31}\ ) \times 10^{-3}$		378
$K^*_2(1430)^-\pi^+,\ K^*_2(1430)^- \to K^0_S\pi^-$		$(\ 3.4\ ^{+\ 1.9}_{-\ 1.0}\ ) \times 10^{-4}$		367
$K^*(1680)^-\pi^+,\ K^*(1680)^- \to K^0_S\pi^-$		$(\ 4 \pm 4\ ) \times 10^{-4}$		46
$K^*(892)^+\pi^-,\ K^*(892)^+ \to K^0_S\pi^+$	[o]	$(\ 1.13\ ^{+\ 0.60}_{-\ 0.34}\ ) \times 10^{-4}$		711
$K^*_0(1430)^+\pi^-,\ K^*_0(1430)^+ \to K^0_S\pi^+$	[o]	$< 1.4 \times 10^{-5}$	CL=95%	–
$K^*_2(1430)^+\pi^-,\ K^*_2(1430)^+ \to K^0_S\pi^+$	[o]	$< 3.4 \times 10^{-5}$	CL=95%	–
$K^0_S\pi^+\pi^-$ nonresonant		$(\ 2.5\ ^{+\ 6.0}_{-\ 1.6}\ ) \times 10^{-4}$		842
$K^-\pi^+\pi^0$	[c]	$(13.9 \pm 0.5\ )\ \%$	S=1.7	844
$K^-\rho^+$		$(10.8 \pm 0.7\ )\ \%$		675
$K^-\rho(1700)^+,\ \rho(1700)^+ \to \pi^+\pi^0$		$(\ 7.9 \pm 1.7\ ) \times 10^{-3}$		†
$K^*(892)^-\pi^+,\ K^*(892)^- \to K^-\pi^0$		$(\ 2.21\ ^{+\ 0.40}_{-\ 0.19}\ )\ \%$		711
$\overline{K}^*(892)^0\pi^0,\ \overline{K}^*(892)^0 \to K^-\pi^+$		$(\ 1.88 \pm 0.23\ )\ \%$		711
$K^*_0(1430)^-\pi^+,\ K^*_0(1430)^- \to K^-\pi^0$		$(\ 4.6 \pm 2.1\ ) \times 10^{-3}$		378

$\overline{K}_0^*(1430)^0\pi^0$,		(5.7 $^{+\ 5.0}_{-\ 1.5}$) $\times 10^{-3}$		379
$\overline{K}_0^*(1430)^0 \to\ K^-\pi^+$				
$K^*(1680)^-\pi^+$,		(1.8 $\pm$ 0.7) $\times 10^{-3}$		46
$K^*(1680)^- \to\ K^-\pi^0$				
$K^-\pi^+\pi^0$ nonresonant		(1.11 $^{+\ 0.50}_{-\ 0.19}$) %		844
$K_S^0 2\pi^0$		(8.3 $\pm$ 0.6) $\times 10^{-3}$		843
$\overline{K}^*(892)^0\pi^0$,		(6.6 $^{+\ 1.8}_{-\ 1.5}$) $\times 10^{-3}$		711
$\overline{K}^*(892)^0 \to\ K_S^0\pi^0$				
$K_S^0 2\pi^0$ nonresonant		(4.4 $\pm$ 1.1) $\times 10^{-3}$		843
$K^-2\pi^+\pi^-$	[c]	(8.07 $^{+\ 0.21}_{-\ 0.19}$) %	S=1.4	813
$K^-\pi^+\rho^0$ total		(6.74 $\pm$ 0.33) %		609
$K^-\pi^+\rho^0$ 3-body		(5.1 $\pm$ 2.3) $\times 10^{-3}$		609
$\overline{K}^*(892)^0\rho^0$,		(1.05 $\pm$ 0.23) %		416
$\overline{K}^*(892)^0 \to\ K^-\pi^+$				
$K^- a_1(1260)^+$,		(3.6 $\pm$ 0.6) %		327
$a_1(1260)^+ \to\ 2\pi^+\pi^-$				
$\overline{K}^*(892)^0\pi^+\pi^-$ total,		(1.6 $\pm$ 0.4) %		685
$\overline{K}^*(892)^0 \to\ K^-\pi^+$				
$\overline{K}^*(892)^0\pi^+\pi^-$ 3-body,		(9.9 $\pm$ 2.3) $\times 10^{-3}$		685
$\overline{K}^*(892)^0 \to\ K^-\pi^+$				
$K_1(1270)^-\pi^+$,	[p]	(2.9 $\pm$ 0.3) $\times 10^{-3}$		484
$K_1(1270)^- \to\ K^-\pi^+\pi^-$				
$K^-2\pi^+\pi^-$ nonresonant		(1.88 $\pm$ 0.26) %		813
$K_S^0\pi^+\pi^-\pi^0$	[q]	(5.2 $\pm$ 0.6) %		813
$K_S^0\eta$, $\eta \to\ \pi^+\pi^-\pi^0$		(1.02 $\pm$ 0.09) $\times 10^{-3}$		772
$K_S^0\omega$, $\omega \to\ \pi^+\pi^-\pi^0$		(9.9 $\pm$ 0.5) $\times 10^{-3}$		670
$K^-2\pi^+\pi^-\pi^0$		(4.2 $\pm$ 0.4) %		771
$\overline{K}^*(892)^0\pi^+\pi^-\pi^0$,		(1.3 $\pm$ 0.6) %		643
$\overline{K}^*(892)^0 \to\ K^-\pi^+$				
$K^-\pi^+\omega$, $\omega \to\ \pi^+\pi^-\pi^0$		(2.7 $\pm$ 0.5) %		605
$\overline{K}^*(892)^0\omega$,		(6.5 $\pm$ 3.0) $\times 10^{-3}$		410
$\overline{K}^*(892)^0 \to\ K^-\pi^+$,				
$\omega \to\ \pi^+\pi^-\pi^0$				
$K_S^0\eta\pi^0$		(5.5 $\pm$ 1.1) $\times 10^{-3}$		721
$K_S^0 a_0(980)$, $a_0(980) \to\ \eta\pi^0$		(6.5 $\pm$ 2.0) $\times 10^{-3}$		–
$\overline{K}^*(892)^0\eta$,		(1.6 $\pm$ 0.5) $\times 10^{-3}$		–
$\overline{K}^*(892)^0 \to\ K_S^0\pi^0$				
$K_S^0 2\pi^+2\pi^-$		(2.67 $\pm$ 0.28) $\times 10^{-3}$		768
$K_S^0\rho^0\pi^+\pi^-$, no $K^*(892)^-$		(1.1 $\pm$ 0.7) $\times 10^{-3}$		–

$K^*(892)^- 2\pi^+\pi^-$, $K^*(892)^- \to K^0_S\pi^-$, no ρ^0	(5 ± 8) $\times 10^{-4}$			642
$K^*(892)^-\rho^0\pi^+$, $K^*(892)^- \to K^0_S\pi^-$	(1.6 ± 0.6) $\times 10^{-3}$			230
$K^0_S 2\pi^+ 2\pi^-$ nonresonant	< 1.2	$\times 10^{-3}$	CL=90%	768
$K^- 3\pi^+ 2\pi^-$	(2.2 ± 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.)

$K^0_S\eta$	(4.5 ± 0.4) $\times 10^{-3}$		S=1.5		772
$K^0_S\omega$	(1.11 ± 0.06) %				670
$K^0_S\eta'(958)$	(9.4 ± 0.5) $\times 10^{-3}$				565
$K^- a_1(1260)^+$	(7.8 ± 1.1) %				327
$K^- a_2(1320)^+$	< 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	(1.48 ± 0.34) %				685
$\overline{K}^*(892)^0\rho^0$	(1.57 ± 0.34) %				417
$\overline{K}^*(892)^0\rho^0$ transverse	(1.7 ± 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
$K_1(1270)^-\pi^+$	[p] (1.6 ± 0.8) %				484
$K_1(1400)^-\pi^+$	< 1.2	%	CL=90%		386
$\overline{K}^*(892)^0\pi^+\pi^-\pi^0$	(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%		119

Hadronic modes with three K's

$K^0_S K^+ K^-$	(4.45 ± 0.28) $\times 10^{-3}$			544
$K^0_S a_0(980)^0$, $a_0^0 \to K^+K^-$	(3.0 ± 0.4) $\times 10^{-3}$			–
$K^- a_0(980)^+$, $a_0^+ \to K^+K^0_S$	(6.0 ± 1.8) $\times 10^{-4}$			–
$K^+ a_0(980)^-$, $a_0^- \to K^-K^0_S$	< 1.1	$\times 10^{-4}$	CL=95%	–
$K^0_S f_0(980)$, $f_0 \to K^+K^-$	< 9	$\times 10^{-5}$	CL=95%	–
$K^0_S\phi$, $\phi \to K^+K^-$	(2.04 ± 0.14) $\times 10^{-3}$			520
$K^0_S f_0(1370)$, $f_0 \to K^+K^-$	(1.7 ± 1.1) $\times 10^{-4}$			–
$3K^0_S$	(9.1 ± 1.3) $\times 10^{-4}$			539

$K^+ 2K^- \pi^+$	$(2.21 \pm 0.31) \times 10^{-4}$		434
$K^+ K^- \overline{K}^*(892)^0$, $\overline{K}^*(892)^0 \to K^- \pi^+$	$(4.4 \pm 1.7) \times 10^{-5}$		†
$K^- \pi^+ \phi$, $\phi \to K^+ K^-$	$(4.0 \pm 1.7) \times 10^{-5}$		422
$\phi \overline{K}^*(892)^0$, $\phi \to K^+ K^-$, $\overline{K}^*(892)^0 \to K^- \pi^+$	$(1.06 \pm 0.20) \times 10^{-4}$		†
$K^+ 2K^- \pi^+$ nonresonant	$(3.3 \pm 1.5) \times 10^{-5}$		434
$2K^0_S K^\pm \pi^\mp$	$(6.0 \pm 1.3) \times 10^{-4}$		427

Pionic modes

$\pi^+ \pi^-$	$(1.400 \pm 0.026) \times 10^{-3}$	S=1.1	922
$2\pi^0$	$(8.0 \pm 0.5) \times 10^{-4}$		923
$\pi^+ \pi^- \pi^0$	(1.43 ± 0.06) %	S=1.9	907
$\rho^+ \pi^-$	$(9.8 \pm 0.4) \times 10^{-3}$		764
$\rho^0 \pi^0$	$(3.72 \pm 0.22) \times 10^{-3}$		764
$\rho^- \pi^+$	$(4.96 \pm 0.24) \times 10^{-3}$		764
$\rho(1450)^+ \pi^-$, $\rho(1450)^+ \to \pi^+ \pi^0$	$(1.6 \pm 2.0) \times 10^{-5}$		–
$\rho(1450)^0 \pi^0$, $\rho(1450)^0 \to \pi^+ \pi^-$	$(4.3 \pm 1.9) \times 10^{-5}$		–
$\rho(1450)^- \pi^+$, $\rho(1450)^- \to \pi^- \pi^0$	$(2.6 \pm 0.4) \times 10^{-4}$		–
$\rho(1700)^+ \pi^-$, $\rho(1700)^+ \to \pi^+ \pi^0$	$(5.9 \pm 1.4) \times 10^{-4}$		–
$\rho(1700)^0 \pi^0$, $\rho(1700)^0 \to \pi^+ \pi^-$	$(7.2 \pm 1.7) \times 10^{-4}$		–
$\rho(1700)^- \pi^+$, $\rho(1700)^- \to \pi^- \pi^0$	$(4.6 \pm 1.1) \times 10^{-4}$		–
$f_0(980) \pi^0$, $f_0(980) \to \pi^+ \pi^-$	$(3.6 \pm 0.8) \times 10^{-5}$		–
$f_0(600) \pi^0$, $f_0(600) \to \pi^+ \pi^-$	$(1.17 \pm 0.21) \times 10^{-4}$		–
$f_0(1370) \pi^0$, $f_0(1370) \to \pi^+ \pi^-$	$(5.3 \pm 2.0) \times 10^{-5}$		–
$f_0(1500) \pi^0$, $f_0(1500) \to \pi^+ \pi^-$	$(5.6 \pm 1.5) \times 10^{-5}$		–
$f_0(1710) \pi^0$, $f_0(1710) \to \pi^+ \pi^-$	$(4.4 \pm 1.5) \times 10^{-5}$		–
$f_2(1270) \pi^0$, $f_2(1270) \to \pi^+ \pi^-$	$(1.89 \pm 0.20) \times 10^{-4}$		–
$\pi^+ \pi^- \pi^0$ nonresonant	$(1.20 \pm 0.35) \times 10^{-4}$		907
$3\pi^0$	$< 3.5 \times 10^{-4}$	CL=90%	908
$2\pi^+ 2\pi^-$	$(7.42 \pm 0.21) \times 10^{-3}$	S=1.1	880
$a_1(1260)^+ \pi^-$, $a_1^+ \to 2\pi^+ \pi^-$ total	$(4.45 \pm 0.31) \times 10^{-3}$		–

$a_1(1260)^+\pi^-$, $a_1^+ \to$ $\rho^0\pi^+$ S-wave		(3.21 ± 0.25) × 10^{-3}			–
$a_1(1260)^+\pi^-$, $a_1^+ \to$ $\rho^0\pi^+$ D-wave		(1.9 ± 0.5) × 10^{-4}			–
$a_1(1260)^+\pi^-$, $a_1^+ \to$ $\sigma\pi^+$		(6.2 ± 0.7) × 10^{-4}			–
$2\rho^0$ total		(1.82 ± 0.13) × 10^{-3}			518
$2\rho^0$, parallel helicities		(8.2 ± 3.2) × 10^{-5}			–
$2\rho^0$, perpendicular helicities		(4.7 ± 0.6) × 10^{-4}			–
$2\rho^0$, longitudinal helicities		(1.25 ± 0.10) × 10^{-3}			–
Resonant $(\pi^+\pi^-)\pi^+\pi^-$ 3-body total		(1.48 ± 0.12) × 10^{-3}			–
$\sigma\pi^+\pi^-$		(6.1 ± 0.9) × 10^{-4}			–
$f_0(980)\pi^+\pi^-$, $f_0 \to$ $\pi^+\pi^-$		(1.8 ± 0.5) × 10^{-4}			–
$f_2(1270)\pi^+\pi^-$, $f_2 \to$ $\pi^+\pi^-$		(3.6 ± 0.6) × 10^{-4}			–
$\pi^+\pi^-2\pi^0$		(10.0 ± 0.9) × 10^{-3}			882
$\eta\pi^0$	[r]	(6.8 ± 0.7) × 10^{-4}			846
$\omega\pi^0$	[r]	< 2.6	× 10^{-4}	CL=90%	761
$2\pi^+2\pi^-\pi^0$		(4.1 ± 0.5) × 10^{-3}			844
$\eta\pi^+\pi^-$	[r]	(1.09 ± 0.16) × 10^{-3}			827
$\omega\pi^+\pi^-$	[r]	(1.6 ± 0.5) × 10^{-3}			738
$3\pi^+3\pi^-$		(4.2 ± 1.2) × 10^{-4}			795
$\eta'(958)\pi^0$		(8.9 ± 1.4) × 10^{-4}			678
$\eta'(958)\pi^+\pi^-$		(4.5 ± 1.7) × 10^{-4}			650
2η		(1.67 ± 0.20) × 10^{-3}			754
$\eta\eta'(958)$		(1.05 ± 0.26) × 10^{-3}			537

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

K^+K^-		(3.96 ± 0.08) × 10^{-3}		S=1.4	791
$2K^0_S$		(1.73 ± 0.29) × 10^{-4}		S=1.7	789
$K^0_S K^-\pi^+$		(3.3 ± 0.5) × 10^{-3}		S=1.1	739
$\overline{K}^*(892)^0 K^0_S$, $\overline{K}^*(892)^0 \to K^-\pi^+$		< 5	× 10^{-4}	CL=90%	608
$K^0_S K^+\pi^-$		(2.6 ± 0.5) × 10^{-3}			739
$K^*(892)^0 K^0_S$, $K^*(892)^0 \to K^+\pi^-$		< 2.8	× 10^{-4}	CL=90%	608
$K^+K^-\pi^0$		(3.28 ± 0.14) × 10^{-3}			743
$K^*(892)^+K^-$, $K^*(892)^+ \to K^+\pi^0$		(1.46 ± 0.07) × 10^{-3}			–
$K^*(892)^-K^+$, $K^*(892)^- \to K^-\pi^0$		(5.2 ± 0.4) × 10^{-4}			–
$(K^+\pi^0)_{S-wave}K^-$		(2.33 ± 0.17) × 10^{-3}			743

$(K^-\pi^0)_{S-wave}K^+$		(1.3 ± 0.4) $\times 10^{-4}$		743
$f_0(980)\pi^0$, $f_0 \to K^+K^-$		(3.4 ± 0.6) $\times 10^{-4}$		–
$\phi\pi^0$, $\phi \to K^+K^-$		(6.4 ± 0.4) $\times 10^{-4}$		–
$2K^0_S\pi^0$		< 5.9 $\times 10^{-4}$		740
$K^+K^-\pi^+\pi^-$	[s]	(2.42 ± 0.12) $\times 10^{-3}$		677
$\phi\pi^+\pi^-$ 3-body, $\phi \to K^+K^-$		(2.4 ± 2.4) $\times 10^{-5}$		614
$\phi\rho^0$, $\phi \to K^+K^-$		(7.0 ± 0.6) $\times 10^{-4}$		250
$K^+K^-\rho^0$ 3-body		(5 ± 7) $\times 10^{-5}$		302
$f_0(980)\pi^+\pi^-$, $f_0 \to K^+K^-$		(3.6 ± 0.9) $\times 10^{-4}$		–
$K^*(892)^0K^\mp\pi^\pm$ 3-body, $K^{*0} \to K^\pm\pi^\mp$	[t]	(2.7 ± 0.6) $\times 10^{-4}$		531
$K^*(892)^0\overline{K}^*(892)^0$, $K^{*0} \to K^\pm\pi^\mp$		(7 ± 5) $\times 10^{-5}$		272
$K_1(1270)^\pm K^\mp$, $K_1(1270)^\pm \to K^\pm\pi^+\pi^-$		(8.0 ± 1.8) $\times 10^{-4}$		–
$K_1(1400)^\pm K^\mp$, $K_1(1400)^\pm \to K^\pm\pi^+\pi^-$		(5.3 ± 1.2) $\times 10^{-4}$		–
$2K^0_S\pi^+\pi^-$		(1.22 ± 0.23) $\times 10^{-3}$		673
$K^0_SK^-2\pi^+\pi^-$		< 1.4 $\times 10^{-4}$	CL=90%	595
$K^+K^-\pi^+\pi^-\pi^0$		(3.1 ± 2.0) $\times 10^{-3}$		600

Other $K\overline{K}X$ modes. They include all decay modes of the ϕ, η, and ω.

$\phi\eta$		(1.4 ± 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
$\phi\gamma$		(2.69 ± 0.35) $\times 10^{-5}$		654
$\overline{K}^*(892)^0\gamma$		(3.27 ± 0.34) $\times 10^{-4}$		719

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

$K^+\ell^-\overline{\nu}_\ell$ via $\overline{D}^0$		< 2.2 $\times 10^{-5}$	CL=90%	–
K^+ or $K^*(892)^+e^-\overline{\nu}_e$ via $\overline{D}^0$		< 6 $\times 10^{-5}$	CL=90%	–
$K^+\pi^-$	*DC*	(1.47 ± 0.07) $\times 10^{-4}$	S=2.8	861
$K^+\pi^-$ via DCS		(1.31 ± 0.08) $\times 10^{-4}$		–
$K^+\pi^-$ via $\overline{D}^0$		< 1.5 $\times 10^{-5}$	CL=95%	861
$K^0_S\pi^+\pi^-$ in $D^0 \to \overline{D}^0$		< 1.8 $\times 10^{-4}$	CL=95%	–
$K^*(892)^+\pi^-$, $K^*(892)^+ \to K^0_S\pi^+$	*DC*	(1.13 $^{+\ 0.60}_{-\ 0.34}$) $\times 10^{-4}$		711
$K^*_0(1430)^+\pi^-$, $K^*_0(1430)^+ \to K^0_S\pi^+$	*DC*	< 1.4 $\times 10^{-5}$		–

$K_2^*(1430)^+\pi^-$, $K_2^*(1430)^+ \to K_S^0\pi^+$	*DC*	<	3.4	$\times 10^{-5}$	–
$K^+\pi^-\pi^0$	*DC*		(3.04 ± 0.17)	$\times 10^{-4}$	844
$K^+\pi^-\pi^0$ via $\overline{D}^0$			(7.3 ± 0.5)	$\times 10^{-4}$	–
$K^+\pi^+2\pi^-$	*DC*		(2.61 $^{+\ 0.21}_{-\ 0.19}$)	$\times 10^{-4}$	813
$K^+\pi^+2\pi^-$ 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, Lepton (*L*) or Baryon (*B*) number violating modes

$\gamma\gamma$	*C1*	<	2.6	$\times 10^{-5}$ CL=90%	932
e^+e^-	*C1*	<	7.9	$\times 10^{-8}$ CL=90%	932
$\mu^+\mu^-$	*C1*	<	1.4	$\times 10^{-7}$ 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
ηe^+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
ωe^+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
ϕe^+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
$\overline{K}^0 e^+e^-$		[*h*] <	1.1	$\times 10^{-4}$ CL=90%	866
$\overline{K}^0\mu^+\mu^-$		[*h*] <	2.6	$\times 10^{-4}$ CL=90%	852
$K^-\pi^+e^+e^-$	*C1*	<	3.85	$\times 10^{-4}$ CL=90%	861
$\overline{K}^*(892)^0 e^+e^-$		[*h*] <	4.7	$\times 10^{-5}$ CL=90%	719
$K^-\pi^+\mu^+\mu^-$	*C1*	<	3.59	$\times 10^{-4}$ CL=90%	829
$\overline{K}^*(892)^0\mu^+\mu^-$		[*h*] <	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*	[*i*] <	2.6	$\times 10^{-7}$ CL=90%	929
$\pi^0 e^\pm\mu^\mp$	*LF*	[*i*] <	8.6	$\times 10^{-5}$ CL=90%	924
$\eta e^\pm\mu^\mp$	*LF*	[*i*] <	1.0	$\times 10^{-4}$ CL=90%	848
$\pi^+\pi^-e^\pm\mu^\mp$	*LF*	[*i*] <	1.5	$\times 10^{-5}$ CL=90%	911
$\rho^0 e^\pm\mu^\mp$	*LF*	[*i*] <	4.9	$\times 10^{-5}$ CL=90%	767
$\omega e^\pm\mu^\mp$	*LF*	[*i*] <	1.2	$\times 10^{-4}$ CL=90%	764
$K^-K^+e^\pm\mu^\mp$	*LF*	[*i*] <	1.8	$\times 10^{-4}$ CL=90%	754
$\phi e^\pm\mu^\mp$	*LF*	[*i*] <	3.4	$\times 10^{-5}$ CL=90%	648
$\overline{K}^0 e^\pm\mu^\mp$	*LF*	[*i*] <	1.0	$\times 10^{-4}$ CL=90%	863

$K^-\pi^+e^\pm\mu^\mp$	*LF*	[*i*] <	5.53	$\times 10^{-4}$ CL=90%	848
$\overline{K}^*(892)^0e^\pm\mu^\mp$	*LF*	[*i*] <	8.3	$\times 10^{-5}$ CL=90%	714
$2\pi^-2e^+$ + c.c.	*L*	<	1.12	$\times 10^{-4}$ CL=90%	922
$2\pi^-2\mu^+$ + c.c.	*L*	<	2.9	$\times 10^{-5}$ CL=90%	894
$K^-\pi^-2e^+$ + c.c.	*L*	<	2.06	$\times 10^{-4}$ CL=90%	861
$K^-\pi^-2\mu^+$ + c.c.	*L*	<	3.9	$\times 10^{-4}$ CL=90%	829
$2K^-2e^+$ + c.c.	*L*	<	1.52	$\times 10^{-4}$ CL=90%	791
$2K^-2\mu^+$ + 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
$2K^-e^+\mu^+$ + c.c.	*L*	<	5.7	$\times 10^{-5}$ CL=90%	754
pe^-	*L*,*B*	[*u*] <	1.0	$\times 10^{-5}$ CL=90%	696
$\overline{p}e^+$	*L*,*B*	[*v*] <	1.1	$\times 10^{-5}$ CL=90%	696

$D^*(2007)^0$

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

Mass $m = 2006.93 \pm 0.16$ MeV
$m_{D^{*0}} - m_{D^0} = 142.12 \pm 0.07$ 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 $m = 2010.22 \pm 0.14$ MeV
$m_{D^*(2010)^+} - m_{D^+} = 140.66 \pm 0.10$ 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

$D_0^*(2400)^0$

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

Mass $m = 2318 \pm 29$ MeV (S = 1.7)
Full width $\Gamma = 267 \pm 40$ MeV

$D_0^*(2400)^0$ DECAY MODES	Fraction (Γ_i/Γ)	p (MeV/c)
$D^+\pi^-$	seen	385

$D_1(2420)^0$

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

Mass $m = 2421.3 \pm 0.6$ MeV (S = 1.2)
$m_{D_1^0} - m_{D^{*+}} = 411.0 \pm 0.6$ (S = 1.2)
Full width $\Gamma = 27.1 \pm 2.7$ MeV (S = 2.4)

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

$D_1(2420)^0$ DECAY MODES	Fraction (Γ_i/Γ)	p (MeV/c)
$D^*(2010)^+\pi^-$	seen	354
$D^0\pi^+\pi^-$	seen	425
$D^+\pi^-$	not seen	473
$D^{*0}\pi^+\pi^-$	not seen	279

$D_2^*(2460)^0$

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

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

Mass $m = 2462.6 \pm 0.7$ MeV (S = 1.3)
$m_{D_2^{*0}} - m_{D^+} = 593.0 \pm 0.7$ MeV (S = 1.3)
$m_{D_2^{*0}} - m_{D^{*+}} = 452.4 \pm 0.7$ MeV (S = 1.3)
Full width $\Gamma = 49.0 \pm 1.4$ MeV (S = 1.7)

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

$D_2^*(2460)^0$ DECAY MODES	Fraction (Γ_i/Γ)	p (MeV/c)
$D^+\pi^-$	seen	507
$D^*(2010)^+\pi^-$	seen	391
$D^0\pi^+\pi^-$	not seen	463
$D^{*0}\pi^+\pi^-$	not seen	326

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

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

Mass $m = 2464.4 \pm 1.9$ MeV (S = 1.9)
$m_{D_2^*(2460)^\pm} - m_{D_2^*(2460)^0} = 2.4 \pm 1.7$ 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	512
$D^{*0}\pi^+$	seen	395
$D^+\pi^+\pi^-$	not seen	461
$D^{*+}\pi^+\pi^-$	not seen	325

NOTES

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

[b] See the Particle Listings for the (complicated) definition of this quantity.

[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 in the Particle Listings.

[d] These subfractions of the $K^-2\pi^+$ mode are uncertain: see the Particle Listings.

[e] Submodes of the $D^+ \to K^-2\pi^+\pi^0$ and $K_S^0 2\pi^+\pi^-$ modes were studied by ANJOS 92C and COFFMAN 92B, but with at most 142 events for the first mode and 229 for the second – not enough for precise results. With nothing new for 18 years, we refer to our 2008 edition, Physics Letters **B667** 1 (2008), for those results.

[f] The unseen decay modes of the resonances are included.

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

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

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

[j] We are leaving the D^0 mixing numbers unchanged from the 2010 Review, awaiting a comprehensive re-analysis by the Heavy Flavor Averaging Group. This would include as-yet-unpublished results from CLEO. Note,

however, that there are in the Listings new measurements of the D_1^0-D_2^0 mass and width differences from BABAR.

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

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

[m] This is the sum of our $K^-3\pi^+2\pi^-$ and $3\pi^+3\pi^-$ branching fractions.

[n] 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 6.20 $\pm$ 0.17 %.

[o] This is a doubly Cabibbo-suppressed mode.

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

[q] Submodes of the $D^0 \to K_S^0\pi^+\pi^-\pi^0$ mode with a K^* and/or ρ were studied by COFFMAN 92B, but with only 140 events. With nothing new for 18 years, we refer to our 2008 edition, Physics Letters **B667** 1 (2008), for those results.

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

[s] 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.

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

[u] This limit is for either D^0 or $\overline{D}^0$ to pe^-.

[v] This limit is for either D^0 or $\overline{D}^0$ to $\overline{p}e^+$.