$c\overline{c}$ MESONS (including possibly non-$q\overline{q}$ states)

$\eta_c(1S)$

$I^G(J^{PC}) = 0^+(0^{-+})$

Mass $m = 2984.1 \pm 0.4$ MeV (S = 1.2)
Full width $\Gamma = 30.5 \pm 0.5$ MeV (S = 1.2)

$\eta_c(1S)$ DECAY MODES	Fraction (Γ_i/Γ)	Scale factor/ Confidence level	p (MeV/c)
Decays involving hadronic resonances			
$\eta'(958)\pi\pi$	(2.0 ±0.4) %	S=1.4	1323
$\eta'(958)K\overline{K}$	(1.73±0.35) %		1131
$\eta'(958)\eta\eta$	(3.4 ±0.6) $\times 10^{-3}$		1081
$\rho\rho$	(1.8 ±0.4) %		1275
$K^*(892)^0 K^-\pi^+$ + c.c.	(1.8 ±0.5) %		1278
$K^*(892)\overline{K}^*(892)$	(7.0 ±1.2) $\times 10^{-3}$		1196
$K^*(892)^0\overline{K}^*(892)^0\pi^+\pi^-$	(1.4 ±0.6) %		1074
$\phi K^+ K^-$	(3.3 $^{+1.2}_{-1.1}$) $\times 10^{-3}$		1104
$\phi\phi$	(1.8 ±0.4) $\times 10^{-3}$	S=2.3	1089
$\phi 2(\pi^+\pi^-)$	< 4 $\times 10^{-3}$	CL=90%	1251
$a_0(980)\pi$	seen		1327
$a_2(1320)\pi$	seen		1196
$K^*(892)\overline{K}$ + c.c.	< 1.28 %	CL=90%	1310
$f_2(1270)\eta$	seen		1145
$f_2(1270)\eta'$	seen		984
$\omega\omega$	(2.7 ±0.9) $\times 10^{-3}$	S=2.1	1270
$\omega\phi$	< 2.5 $\times 10^{-4}$	CL=90%	1185
$f_2(1270)f_2(1270)$	(1.08±0.27) %		774
$f_2(1270)f_2'(1525)$	(9.7 ±3.2) $\times 10^{-3}$		524
$f_0(500)\eta$	seen		–
$f_0(500)\eta'$	seen		–
$f_0(980)\eta$	seen		1265
$f_0(980)\eta'$	seen		1130
$f_0(1500)\eta$	seen		1016
$f_0(1710)\eta'$	seen		623
$f_0(2100)\eta'$	seen		†
$f_0(2200)\eta$	seen		498
$a_0(1320)\pi$	seen		–
$a_0(1450)\pi$	seen		1140

$a_2(1700)\pi$	seen		999
$a_0(1710)\pi$	seen		994
$a_0(1950)\pi$	seen		860
$K_0^*(1430)\overline{K}$ + c.c.	seen		1086
$K_2^*(1430)\overline{K}$ + c.c.	seen		1084
$K_0^*(1950)\overline{K}$ + c.c.	seen		742
$K_0^*(2600)\overline{K}$ + c.c.	seen		–

Decays into stable hadrons

$K\overline{K}\pi$	(7.1 ±0.4) %	S=1.1	1381
$K\overline{K}\eta$	(1.32±0.15) %		1265
$\eta\pi^+\pi^-$	(1.6 ±0.4) %		1428
$\eta 2(\pi^+\pi^-)$	(4.3 ±1.3) %		1386
$K^+K^-\pi^+\pi^-$	(8.3 ±1.8) $\times 10^{-3}$	S=1.9	1345
$K^+K^-\pi^+\pi^-\pi^0$	(3.4 ±0.6) %		1304
$K^0K^-\pi^+\pi^-\pi^+$ + c.c.	(5.4 ±1.5) %		1302
$K^+K^-2(\pi^+\pi^-)$	(8.4 ±2.4) $\times 10^{-3}$		1254
$2(K^+K^-)$	(1.4 ±0.4) $\times 10^{-3}$	S=1.4	1056
$\pi^+\pi^-\pi^0$	< 4 $\times 10^{-4}$	CL=90%	1476
$\pi^+\pi^-\pi^0\pi^0$	(4.6 ±1.0) %		1461
$2(\pi^+\pi^-)$	(9.6 ±1.5) $\times 10^{-3}$	S=1.4	1459
$2(\pi^+\pi^-\pi^0)$	(15.9 ±2.0) %		1409
$3(\pi^+\pi^-)$	(1.89±0.34) %		1407
$p\overline{p}$	(1.33±0.11) $\times 10^{-3}$	S=1.1	1160
$p\overline{p}\pi^0$	(3.4 ±1.3) $\times 10^{-3}$		1101
$p\overline{p}\pi^+\pi^-$	(3.7 ±0.5) $\times 10^{-3}$		1027
$\Lambda\overline{\Lambda}$	(1.10±0.28) $\times 10^{-3}$	S=1.5	991
$K^+\overline{p}\Lambda$ + c.c.	(2.5 ±0.4) $\times 10^{-3}$		773
$\overline{\Lambda}(1520)\Lambda$ + c.c.	(3.0 ±1.3) $\times 10^{-3}$		694
$\Sigma^+\overline{\Sigma}^-$	(2.6 ±0.5) $\times 10^{-3}$		901
$\Xi^-\overline{\Xi}^+$	(1.07±0.24) $\times 10^{-3}$		692

Radiative decays

$\gamma\gamma$	(1.66±0.13) $\times 10^{-4}$	S=1.2	1492

Charge conjugation (C), Parity (P), Lepton Family number (LF) violating modes

$\pi^+\pi^-$	P,CP < 1.3 $\times 10^{-4}$	CL=90%	1485
$\pi^0\pi^0$	P,CP < 4 $\times 10^{-5}$	CL=90%	1486
K^+K^-	P,CP < 7 $\times 10^{-4}$	CL=90%	1408
$K_S^0K_S^0$	P,CP < 4 $\times 10^{-4}$	CL=90%	1407

$J/\psi(1S)$

$I^G(J^{PC}) = 0^-(1^{--})$

Mass $m = 3096.900 \pm 0.006$ MeV
Full width $\Gamma = 92.6 \pm 1.7$ keV (S = 1.1)

$J/\psi(1S)$ DECAY MODES		Fraction (Γ_i/Γ)	Scale factor/ Confidence level	p (MeV/c)
hadrons		(87.7 ± 0.5) %		–
virtual $\gamma \to$ hadrons		(13.46 ± 0.07) %		–
ggg		(64.1 ± 1.0) %		–
γgg		(8.8 ± 1.1) %		–
e^+e^-		(5.971± 0.032) %		1548
$e^+e^-\gamma$	[a]	(8.8 ± 1.4) $\times 10^{-3}$		1548
$\mu^+\mu^-$		(5.961± 0.033) %		1545
$e^+e^-e^+e^-$		(5.5 ± 0.5) $\times 10^{-5}$		1548
$e^+e^-\mu^+\mu^-$		(3.53 ± 0.26) $\times 10^{-5}$		1545
$\mu^+\mu^-\mu^+\mu^-$		(1.11 ± 0.11) $\times 10^{-6}$		1530
Decays involving hadronic resonances				
$\rho\pi$		(1.88 ± 0.12) %	S=2.6	1448
$\rho^0\pi^0$		(6.2 ± 0.6) $\times 10^{-3}$		1448
$a_2(1320)^0\pi^+\pi^- \to 2(\pi^+\pi^-)\pi^0$		(2.8 ± 0.6) $\times 10^{-3}$		–
$a_2(1320)^+\pi^-\pi^0$ + c.c $\to 2(\pi^+\pi^-)\pi^0$		(3.7 ± 0.7) $\times 10^{-3}$		–
$a_2(1320)\rho$		(1.09 ± 0.22) %		1123
$\eta\pi^+\pi^-$		(3.8 ± 0.7) $\times 10^{-4}$		1487
$\eta\rho$		(1.93 ± 0.23) $\times 10^{-4}$		1396
$\eta\pi^+\pi^-\pi^0$		(1.17 ± 0.20) %		1470
$\eta\pi^+\pi^-3\pi^0$		(4.9 ± 1.0) $\times 10^{-3}$		1419
$\eta\phi(2170) \to \eta\phi f_0(980) \to \eta\phi\pi^+\pi^-$		(1.2 ± 0.4) $\times 10^{-4}$		628
$\eta\phi(2170) \to \eta K^*(892)^0\overline{K}^*(892)^0$		< 2.52 $\times 10^{-4}$	CL=90%	–
ηK^+K^-		(8.6 ± 3.0) $\times 10^{-4}$		1331
$\eta K^\pm K^0_S\pi^\mp$	[b]	(2.2 ± 0.4) $\times 10^{-3}$		1278
$\eta K^*(892)^0\overline{K}^*(892)^0$		(1.15 ± 0.26) $\times 10^{-3}$		1003
$\rho\eta'(958)$		(8.1 ± 0.8) $\times 10^{-5}$	S=1.6	1281
$\rho^\pm\pi^\mp\pi^+\pi^-2\pi^0$		(2.8 ± 0.8) %		1364
$\rho^+\rho^-\pi^+\pi^-\pi^0$		(6 ± 4) $\times 10^{-3}$		1186
$\rho^+K^+K^-\pi^-$ + c.c $\to K^+K^-\pi^+\pi^-\pi^0$		(3.5 ± 0.8) $\times 10^{-3}$		–
$\rho^\mp K^\pm K^0_S$		(1.9 ± 0.4) $\times 10^{-3}$		1269
$\rho(1450)\pi$		seen		1197
$\rho(1450)\pi \to \pi^+\pi^-\pi^0$		(2.2 ± 1.1) $\times 10^{-4}$		–

$\rho(1450)^{\pm}\pi^{\mp} \to K^0_S K^{\pm}\pi^{\mp}$	(3.3 ± 0.6) $\times 10^{-4}$			–
$\rho(1450)^0\pi^0 \to K^+K^-\pi^0$	(2.7 ± 0.6) $\times 10^{-4}$			–
$\rho(1450)\eta'(958) \to \pi^+\pi^-\eta'(958)$	(3.3 ± 0.7) $\times 10^{-6}$			–
$\rho(1700)\pi$	seen			1065
$\rho(1700)\pi \to \pi^+\pi^-\pi^0$	(1.6 ± 1.1) $\times 10^{-4}$			–
$\rho(2150)\pi$	seen			790
$\rho(2150)\pi \to \pi^+\pi^-\pi^0$	(10 ±40) $\times 10^{-6}$			–
$\omega\pi^0$	(4.5 ± 0.5) $\times 10^{-4}$		S=1.4	1446
$\omega\pi^0 \to \pi^+\pi^-\pi^0$	(1.6 ± 0.7) $\times 10^{-5}$			–
$\omega\pi^+\pi^-$	(8.5 ± 1.0) $\times 10^{-3}$		S=1.3	1435
$\omega\pi^0\pi^0$	(3.4 ± 0.8) $\times 10^{-3}$			1436
$\omega 3\pi^0$	(1.9 ± 0.6) $\times 10^{-3}$			1419
$\omega f_2(1270)$	(4.3 ± 0.6) $\times 10^{-3}$			1142
$\omega\eta$	(1.74 ± 0.20) $\times 10^{-3}$		S=1.6	1394
$\omega\pi^+\pi^-\pi^0$	(4.0 ± 0.7) $\times 10^{-3}$			1418
$\omega\pi^0\eta$	(3.4 ± 1.7) $\times 10^{-4}$			1363
$\omega\pi^+\pi^+\pi^-\pi^-$	(8.5 ± 3.4) $\times 10^{-3}$			1392
$\omega\pi^+\pi^-2\pi^0$	(3.3 ± 0.5) %			1394
$\omega\eta'\pi^+\pi^-$	(1.12 ± 0.13) $\times 10^{-3}$			1173
$\omega\eta'(958)$	(1.89 ± 0.18) $\times 10^{-4}$			1279
$\omega f_0(980)$	(1.4 ± 0.5) $\times 10^{-4}$			1267
$\omega f_0(1710) \to \omega K\overline{K}$	(4.8 ± 1.1) $\times 10^{-4}$			878
$\omega f_1(1420)$	(6.8 ± 2.4) $\times 10^{-4}$			1060
$\omega f_2'(1525)$	< 2.2	$\times 10^{-4}$	CL=90%	1007
$\omega X(1835) \to \omega p\overline{p}$	< 3.9	$\times 10^{-6}$	CL=95%	–
$\omega K^+K^-\eta$	(3.33 ± 0.12) $\times 10^{-4}$			996
$\omega X(1835),\ X \to \eta'\pi^+\pi^-$	< 6.2	$\times 10^{-5}$		–
ωK^+K^-	(1.52 ± 0.31) $\times 10^{-3}$			1268
$\omega K^{\pm}K^0_S\pi^{\mp}$	[b] (3.4 ± 0.5) $\times 10^{-3}$			1210
$\omega K\overline{K}$	(1.9 ± 0.4) $\times 10^{-3}$			1268
$\omega K^*(892)\overline{K}$ + c.c.	(6.1 ± 0.9) $\times 10^{-3}$			1097
$\eta' K^{*\pm}K^{\mp}$	(1.48 ± 0.13) $\times 10^{-3}$			–
$\eta' K^{*0}\overline{K}^0$ + c.c.	(1.66 ± 0.21) $\times 10^{-3}$			1000
$\eta' h_1(1415) \to \eta' K^*\overline{K}$ + c.c.	(2.16 ± 0.31) $\times 10^{-4}$			–
$\eta' h_1(1415) \to \eta' K^{*\pm}K^{\mp}$	(1.51 ± 0.23) $\times 10^{-4}$			–
$\eta' h_1(1415) \to \gamma\eta'\eta'$	(4.7 $^{+\ 1.1}_{-\ 2.0}$) $\times 10^{-7}$			–
$\overline{K}K^*(892)$+c.c.	seen			1373
$\overline{K}K^*(892)$+c.c. $\to K^0_S K^{\pm}\pi^{\mp}$	(4.8 ± 0.5) $\times 10^{-3}$			–
$K^+K^*(892)^-$ + c.c.	(6.0 $^{+\ 0.8}_{-\ 1.0}$) $\times 10^{-3}$		S=2.9	1373
$K^+K^*(892)^-$ + c.c. $\to K^+K^-\pi^0$	(2.69 $^{+\ 0.13}_{-\ 0.20}$) $\times 10^{-3}$			–

$K^+ K^*(892)^-$ + c.c. → $K^0 K^\pm \pi^\mp$ + c.c.	(3.0 ± 0.4) × 10^{-3}		–
$K^0 \overline{K}^*(892)^0$ + c.c.	(4.2 ± 0.4) × 10^{-3}		1373
$K^0 \overline{K}^*(892)^0$ + c.c. → $K^0 K^\pm \pi^\mp$ + c.c.	(3.2 ± 0.4) × 10^{-3}		–
$\overline{K}^*(892)^0 K^+ \pi^-$ + c.c.	(5.7 ± 0.8) × 10^{-3}		1343
$K^*(892)^\pm K^\mp \pi^0$	(4.1 ± 1.3) × 10^{-3}		1344
$K^*(892)^+ K^0_S \pi^-$ + c.c.	(2.0 ± 0.5) × 10^{-3}		1342
$K^*(892)^+ K^0_S \pi^-$ + c.c. → $K^0_S K^0_S \pi^+ \pi^-$	(6.7 ± 2.2) × 10^{-4}		–
$K^*(892)^0 K^- \pi^+$ + c.c. → $K^+ K^- \pi^+ \pi^-$	(3.8 ± 0.5) × 10^{-3}		–
$K^*(892)^0 K^0_S \to \gamma K^0_S K^0_S$	(6.3 $^{+0.6}_{-0.5}$) × 10^{-6}		–
$K^*(892)^0 K^0_S \pi^0$	(7 ± 4) × 10^{-4}		1343
$K^*(892)^\pm K^*(700)^\mp$	(1.1 $^{+1.0}_{-0.6}$) × 10^{-3}		–
$K^*(892)^0 \overline{K}^*(892)^0$	(2.3 ± 0.6) × 10^{-4}		1266
$K^*(892)^\pm K^*(892)^\mp$	(1.00 $^{+0.22}_{-0.40}$) × 10^{-3}		1266
$K_1(1400)^\pm K^\mp$	(3.8 ± 1.4) × 10^{-3}		1170
$K^*(1410) \overline{K}$ +c.c.	seen		1165
$K^*(1410) \overline{K}$ +c.c → $K^\pm K^\mp \pi^0$	(7 ± 4) × 10^{-5}		–
$K^*(1410) \overline{K}$ + c.c. → $K^0_S K^\pm \pi^\mp$	(8 ± 5) × 10^{-5}		–
$K^*_2(1430) \overline{K}$ +c.c.	seen		1158
$K^*_2(1430) \overline{K}$ +c.c. → $K^\pm K^\mp \pi^0$	(1.0 ± 0.5) × 10^{-4}		–
$K^*_2(1430) \overline{K}$ + c.c. → $K^0_S K^\pm \pi^\mp$	(3.8 ± 1.0) × 10^{-4}		–
$\overline{K}^*_2(1430) K$ + c.c.	< 4.0 × 10^{-3}	CL=90%	1158
$K^*_2(1430)^+ K^-$ + c.c. → $K^+ K^- \pi^0$	(2.69 $^{+0.25}_{-0.19}$) × 10^{-4}		–
$K^*_2(1430)^0 K^- \pi^+$ + c.c. → $K^+ K^- \pi^+ \pi^-$	(2.6 ± 0.9) × 10^{-3}		–
$K^*_2(1430)^+ K^0_S \pi^-$ + c.c.	(3.6 ± 1.8) × 10^{-3}		1116
$\overline{K}^*_2(1430)^0 K^*(892)^0$ + c.c.	(4.67 ± 0.29) × 10^{-3}		1011
$K^*_2(1430)^- K^*(892)^+$ + c.c.	(3.4 ± 2.9) × 10^{-3}		1011
$K^*_2(1430)^- K^*(892)^+$ + c.c. → $K^*(892)^+ K^0_S \pi^-$ + c.c.	(4 ± 4) × 10^{-4}		–
$K^*_2(1430)^0 \overline{K}^*_2(1430)^0$	< 2.9 × 10^{-3}	CL=90%	601
$\overline{K}_2(1770)^0 K^*(892)^0$ + c.c. → $K^*(892)^0 K^- \pi^+$ + c.c.	(6.9 ± 0.9) × 10^{-4}		–

$K_2^*(1980)^+ K^- +$ c.c. $\rightarrow$ $K^+ K^- \pi^0$		$(1.10 \, {}^{+\ 0.60}_{-\ 0.14}) \times 10^{-5}$		–
$K_4^*(2045)^+ K^- +$ c.c. $\rightarrow$ $K^+ K^- \pi^0$		$(6.2 \, {}^{+\ 2.9}_{-\ 1.6}) \times 10^{-6}$		–
$K_1(1270)^\pm K^\mp$		$< 3.0 \times 10^{-3}$	CL=90%	1240
$K_1(1270) K_S^0 \rightarrow \gamma K_S^0 K_S^0$		$(8.5 \pm 2.5) \times 10^{-7}$		–
$a_2(1320)^\pm \pi^\mp$	[b]	$< 4.3 \times 10^{-3}$	CL=90%	1263
$\phi\pi^0$		3×10^{-6} or 1×10^{-7}		1377
$\phi\pi^+\pi^-$		$(9.4 \pm 1.5) \times 10^{-4}$	S=1.7	1365
$\phi\pi^0\pi^0$		$(4.9 \pm 1.0) \times 10^{-4}$		1366
$\phi 2(\pi^+\pi^-)$		$(1.60 \pm 0.32) \times 10^{-3}$		1318
$\phi\eta$		$(7.4 \pm 0.6) \times 10^{-4}$	S=1.2	1320
$\phi\eta'(958)$		$(4.6 \pm 0.5) \times 10^{-4}$	S=2.2	1192
$\phi\eta\eta'$		$(2.32 \pm 0.17) \times 10^{-4}$		885
$\phi f_0(980)$		$(3.2 \pm 0.9) \times 10^{-4}$	S=1.9	1178
$\phi f_0(980) \rightarrow \phi\pi^+\pi^-$		$(2.58 \pm 0.34) \times 10^{-4}$		–
$\phi f_0(980) \rightarrow \phi\pi^0\pi^0$		$(1.7 \pm 0.5) \times 10^{-4}$		–
$\phi\pi^0 f_0(980) \rightarrow \phi\pi^0\pi^+\pi^-$		$(4.5 \pm 1.0) \times 10^{-6}$		–
$\phi\pi^0 f_0(980) \rightarrow \phi\pi^0 p^0\pi^0$		$(1.7 \pm 0.6) \times 10^{-6}$		1045
$\phi f_0(980)\eta \rightarrow \eta\phi\pi^+\pi^-$		$(3.2 \pm 1.0) \times 10^{-4}$		–
$\phi(1680)^0\pi^0 \rightarrow \phi\eta\pi^0$		$(6.7 \pm 1.1) \times 10^{-6}$		–
$X(2000)^0\pi^0 \rightarrow \phi\eta\pi^0$		$(1.70 \, {}^{+\ 0.50}_{-\ 0.23}) \times 10^{-6}$		–
$h_1(1900)^0\pi^0 \rightarrow \phi\eta\pi^0$		$(8.4 \, {}^{+\ 1.4}_{-\ 1.3}) \times 10^{-6}$		–
$\phi f_2(1270)$		$(3.2 \pm 0.6) \times 10^{-4}$		1036
$\phi f_1(1285)$		$(2.6 \pm 0.5) \times 10^{-4}$		1033
$\phi f_1(1285) \rightarrow \phi\pi^0 f_0(980) \rightarrow \phi\pi^0\pi^+\pi^-$		$(9.4 \pm 2.8) \times 10^{-7}$		952
$\phi f_1(1285) \rightarrow \phi\pi^0 f_0(980) \rightarrow \phi 3\pi^0$		$(2.1 \pm 2.2) \times 10^{-7}$		955
$\phi\eta(1405) \rightarrow \phi\eta\pi^+\pi^-$		$(2.0 \pm 1.0) \times 10^{-5}$		946
$\phi f_2'(1525)$		$(8 \pm 4) \times 10^{-4}$	S=2.7	877
$\phi X(1835) \rightarrow \phi p\overline{p}$		$< 2.1 \times 10^{-7}$	CL=90%	–
$\phi X(1835) \rightarrow \phi\eta\pi^+\pi^-$		$< 2.8 \times 10^{-4}$	CL=90%	578
$\phi X(1870) \rightarrow \phi\eta\pi^+\pi^-$		$< 6.13 \times 10^{-5}$	CL=90%	–
$\phi K\overline{K}$		$(1.77 \pm 0.16) \times 10^{-3}$	S=1.3	1179
$\phi f_0(1710) \rightarrow \phi K\overline{K}$		$(3.6 \pm 0.6) \times 10^{-4}$		875
$\phi K^+ K^-$		$(8.2 \pm 1.1) \times 10^{-4}$		1179
$\phi K_S^0 K_S^0$		$(5.8 \pm 1.5) \times 10^{-4}$		1176
$\phi K^\pm K_S^0 \pi^\mp$	[b]	$(7.2 \pm 0.8) \times 10^{-4}$		1114
$\phi K^*(892)\overline{K} +$ c.c.		$(2.18 \pm 0.23) \times 10^{-3}$		969
$b_1(1235)^\pm \pi^\mp$	[b]	$(3.0 \pm 0.5) \times 10^{-3}$		1300

$b_1(1235)^0\pi^0$		(2.3 ± 0.6) $\times 10^{-3}$			1300
$f_2'(1525)K^+K^-$		(1.04 ± 0.35) $\times 10^{-3}$			897
$\Delta(1232)^+\overline{p}$		< 1	$\times 10^{-4}$	CL=90%	1100
$\Delta(1232)^{++}\overline{p}\pi^-$		(1.6 ± 0.5) $\times 10^{-3}$			1030
$\Delta(1232)^{++}\overline{\Delta}(1232)^{--}$		(1.10 ± 0.29) $\times 10^{-3}$			938
$\overline{\Sigma}(1385)^0 pK^-$		(5.1 ± 3.2) $\times 10^{-4}$			646
$\Sigma(1385)^0\overline{\Lambda}+$ c.c.		< 8.2	$\times 10^{-6}$	CL=90%	911
$\Sigma(1385)^-\overline{\Sigma}^+ +$ c.c.	[b]	(3.0 ± 0.7) $\times 10^{-4}$			855
$\Sigma(1385)^+\overline{\Sigma}^- +$ c.c.		(3.3 ± 0.8) $\times 10^{-4}$			861
$\Sigma(1385)^-\overline{\Sigma}(1385)^+ +$ c.c.	[b]	(1.08 ± 0.06) $\times 10^{-3}$			697
$\Sigma(1385)^+\overline{\Sigma}(1385)^- +$ c.c.		(1.25 ± 0.07) $\times 10^{-3}$			697
$\Sigma(1385)^0\overline{\Sigma}(1385)^0$		(1.07 ± 0.08) $\times 10^{-3}$			697
$\Lambda(1520)\overline{\Lambda}+$ c.c. $\rightarrow\ \gamma\Lambda\overline{\Lambda}$		< 4.1	$\times 10^{-6}$	CL=90%	–
$\overline{\Lambda}(1520)\Lambda+$ c.c.		< 1.80	$\times 10^{-3}$	CL=90%	807
$\Xi^0\overline{\Xi}^0$		(1.17 ± 0.04) $\times 10^{-3}$			818
$\Xi(1530)^-\overline{\Xi}^+ +$ c.c.		(3.18 ± 0.08) $\times 10^{-4}$			600
$\Xi(1530)^0\overline{\Xi}^0$		(3.2 ± 1.4) $\times 10^{-4}$			608
$\Theta(1540)\overline{\Theta}(1540) \rightarrow$ $K^0_S pK^-\overline{n}+$ c.c.	[c]	< 1.1	$\times 10^{-5}$	CL=90%	–
$\Theta(1540)K^-\overline{n} \rightarrow\ K^0_S pK^-\overline{n}$	[c]	< 2.1	$\times 10^{-5}$	CL=90%	–
$\Theta(1540)K^0_S\overline{p} \rightarrow\ K^0_S\overline{p}K^+n$	[c]	< 1.6	$\times 10^{-5}$	CL=90%	–
$\overline{\Theta}(1540)K^+n \rightarrow\ K^0_S\overline{p}K^+n$	[c]	< 5.6	$\times 10^{-5}$	CL=90%	–
$\overline{\Theta}(1540)K^0_S p \rightarrow\ K^0_S pK^-\overline{n}$	[c]	< 1.1	$\times 10^{-5}$	CL=90%	–

Decays into stable hadrons

$2(\pi^+\pi^-)\pi^0$	(4.2 ± 0.4) %		S=2.1	1496
$3(\pi^+\pi^-)\pi^0$	(2.9 ± 0.6) %			1433
$\pi^+\pi^-3\pi^0$	(1.9 ± 0.9) %			1497
$\rho^\pm\pi^\mp\pi^0\pi^0$	(1.41 ± 0.22) %			1421
$\rho^+\rho^-\pi^0$	(6.0 ± 1.1) $\times 10^{-3}$			1298
$\pi^+\pi^-4\pi^0$	(6.5 ± 1.3) $\times 10^{-3}$			1470
$\pi^+\pi^-\pi^0$	(2.00 ± 0.07) %		S=2.0	1533
$2(\pi^+\pi^-\pi^0)$	(1.61 ± 0.20) %			1468
$\pi^+\pi^-\pi^0K^+K^-$	(1.52 ± 0.27) %		S=1.4	1368
$\pi^+\pi^-$	(1.47 ± 0.14) $\times 10^{-4}$			1542
$2(\pi^+\pi^-)$	(3.20 ± 0.25) $\times 10^{-3}$		S=1.2	1517
$3(\pi^+\pi^-)$	(4.3 ± 0.4) $\times 10^{-3}$			1466
$2(\pi^+\pi^-)3\pi^0$	(6.2 ± 0.9) %			1435
$4(\pi^+\pi^-)\pi^0$	(9.0 ± 3.0) $\times 10^{-3}$			1345
$2(\pi^+\pi^-)\eta$	(2.29 ± 0.28) $\times 10^{-3}$			1446
$3(\pi^+\pi^-)\eta$	(7.2 ± 1.5) $\times 10^{-4}$			1379
$2(\pi^+\pi^-\pi^0)\eta$	(1.6 ± 0.5) $\times 10^{-3}$			1381
$\pi^+\pi^-\pi^0\pi^0\eta$	(2.4 ± 0.5) $\times 10^{-3}$			1448
$\rho^\pm\pi^\mp\pi^0\eta$	(1.9 ± 0.8) $\times 10^{-3}$			1326

K^+K^-	(3.06 ± 0.05) × 10^{-4}			1468
$K^0_S K^0_L$	(1.95 ± 0.11) × 10^{-4}	S=2.4		1466
$K^0_S K^0_S$	< 1.4 × 10^{-8}	CL=95%		1466
$K\overline{K}\pi$	(6.1 ± 1.0) × 10^{-3}			1442
$K^+K^-\pi^0$	(2.88 ± 0.12) × 10^{-3}			1442
$K^0_S K^\pm\pi^\mp$	(5.3 ± 0.5) × 10^{-3}			1440
$K^0_S K^0_L\pi^0$	(2.06 ± 0.26) × 10^{-3}			1440
$K^*(892)^0\overline{K}^0$ + c.c. → $K^0_S K^0_L\pi^0$	(1.21 ± 0.18) × 10^{-3}			–
$K^*_2(1430)^0\overline{K}^0$ + c.c. → $K^0_S K^0_L\pi^0$	(4.3 ± 1.3) × 10^{-4}			–
$K^+K^-\pi^+\pi^-$	(7.0 ± 1.0) × 10^{-3}			1407
$K^+K^-\pi^0\pi^0$	(2.13 ± 0.22) × 10^{-3}			1410
$K^+K^-\pi^0\pi^0\pi^0$	(1.61 ± 0.29) × 10^{-3}			1371
$K^0_S K^\pm\pi^\mp\pi^0\pi^0$	(5.3 ± 0.7) × 10^{-3}			1369
$K^0_S K^\pm\pi^\mp\pi^+\pi^-$	(6.3 ± 0.4) × 10^{-3}			1366
$K^0_S K^\pm\rho(770)^\pm\pi^0$	(2.9 ± 0.8) × 10^{-3}			–
$K^0_S K^0_L\pi^+\pi^-$	(3.8 ± 0.6) × 10^{-3}			1406
$K^0_S K^0_L\pi^0\pi^0$	(1.9 ± 0.4) × 10^{-3}			1408
$K^0_S K^0_L\eta$	(1.45 ± 0.33) × 10^{-3}			1328
$K^0_S K^0_S\pi^+\pi^-$	(1.68 ± 0.19) × 10^{-3}			1406
$K^\mp K^0_S\pi^\pm\pi^0$	(5.7 ± 0.5) × 10^{-3}			1408
$K^0_S K^\pm\pi^\mp\rho(770)^0$	(3.1 ± 0.5) × 10^{-3}			–
$K^+K^-2(\pi^+\pi^-)$	(3.1 ± 1.3) × 10^{-3}			1320
$K^+K^-\pi^+\pi^-\eta$	(4.7 ± 0.7) × 10^{-3}			1221
$2(K^+K^-)$	(7.2 ± 0.8) × 10^{-4}			1131
$K^+K^-K^0_S K^0_S$	(4.2 ± 0.7) × 10^{-4}			1127
$K^0_S K^*(892)^0\pi^+\pi^-$	(1.7 ± 0.6) × 10^{-3}			1304
$K^0_S K^*(892)^0\pi^0\pi^0$	(1.01 ± 0.18) × 10^{-3}			1306
$K^\mp K^*(892)^\pm\pi^+\pi^-$	(3.4 ± 1.2) × 10^{-3}			1305
$K^*(892)^\pm K^*(892)^0\pi^\mp$	(4.8 ± 1.0) × 10^{-3}			1213
$K^\mp K^*(892)^\pm\pi^0\pi^0$	(1.57 ± 0.32) × 10^{-3}			1308
$K^*(892)^+K^*(892)^-\pi^0$	(1.12 ± 0.23) %			1214
$p\overline{p}$	(2.120 ± 0.029) × 10^{-3}			1232
$p\overline{p}\pi^0$	(1.19 ± 0.08) × 10^{-3}	S=1.1		1176
$p\overline{p}\pi^+\pi^-$	(6.0 ± 0.5) × 10^{-3}	S=1.3		1107
$p\overline{p}\pi^+\pi^-\pi^0$	[d] (2.3 ± 0.9) × 10^{-3}	S=1.9		1033
$p\overline{p}\eta$	(2.00 ± 0.12) × 10^{-3}			948
$p\overline{p}\rho$	< 3.1 × 10^{-4}	CL=90%		774
$p\overline{p}\omega$	(9.8 ± 1.0) × 10^{-4}	S=1.3		768
$p\overline{p}\eta'(958)$	(1.29 ± 0.14) × 10^{-4}	S=2.0		596
$p\overline{p}\,a_0(980)$ → $p\overline{p}\pi^0\eta$	(6.8 ± 1.8) × 10^{-5}			–

$p\overline{p}\phi$		$(5.19 \pm 0.33) \times 10^{-5}$		527
$p\overline{n}\pi^-$		$(2.12 \pm 0.09) \times 10^{-3}$		1174
$n\overline{n}$		$(2.09 \pm 0.16) \times 10^{-3}$		1231
$n\overline{n}\pi^+\pi^-$		$(4 \pm 4) \times 10^{-3}$		1106
$nN(1440)$		seen		978
$nN(1520)$		seen		928
$nN(1535)$		seen		917
$\Lambda\overline{\Lambda}$		$(1.88 \pm 0.08) \times 10^{-3}$	S=2.6	1074
$\Lambda\overline{\Lambda}\pi^0$		$(3.8 \pm 0.4) \times 10^{-5}$		998
$\Lambda\overline{\Lambda}\pi^+\pi^-$		$(4.3 \pm 1.0) \times 10^{-3}$		903
$\Lambda\overline{\Lambda}\eta$		$(1.62 \pm 0.17) \times 10^{-4}$		672
$\Lambda\overline{\Sigma}^-\pi^+ +$ c.c.	[b]	$(1.26 \pm 0.05) \times 10^{-3}$	S=1.2	950
$\Lambda\overline{\Sigma}^+\pi^- +$ c.c.		$(1.21 \pm 0.07) \times 10^{-3}$	S=1.8	945
$pK^-\overline{\Lambda}+$c.c.		$(8.6 \pm 1.1) \times 10^{-4}$		876
$pK^-\overline{\Sigma}^0$		$(2.9 \pm 0.8) \times 10^{-4}$		819
$pK^0_S\overline{\Sigma}^-+$c.c.		$(2.73 \pm 0.05) \times 10^{-4}$		819
$\overline{\Lambda}nK^0_S +$ c.c.		$(6.5 \pm 1.1) \times 10^{-4}$		872
$\Lambda\overline{\Sigma} +$ c.c.		$(2.83 \pm 0.23) \times 10^{-5}$		1034
$\Sigma^+\overline{\Sigma}^-$		$(1.07 \pm 0.04) \times 10^{-3}$		992
$\Sigma^0\overline{\Sigma}^0$		$(1.172 \pm 0.032) \times 10^{-3}$	S=1.4	988
$\Sigma^+\overline{\Sigma}^-\eta$		$(6.3 \pm 0.4) \times 10^{-5}$		498
$\Xi^-\overline{\Xi}^+$		$(9.7 \pm 0.8) \times 10^{-4}$	S=1.4	807

Radiative decays

$\gamma\eta_c(1S)$		(1.41 ± 0.14) %	S=1.3	111
$\gamma\eta_c(1S) \rightarrow 3\gamma$		seen		–
$\gamma\eta_c(1S) \rightarrow \gamma\eta\eta'$		seen		–
3γ		$(1.16 \pm 0.22) \times 10^{-5}$		1548
4γ		$< 9 \times 10^{-6}$	CL=90%	1548
5γ		$< 1.5 \times 10^{-5}$	CL=90%	1548
$\gamma\pi^0$		$(3.39 \pm 0.08) \times 10^{-5}$		1546
$\gamma\pi^0\pi^0$		$(1.15 \pm 0.05) \times 10^{-3}$		1543
$\gamma 2\pi^+ 2\pi^-$		$(2.8 \pm 0.5) \times 10^{-3}$	S=1.9	1517
$\gamma f_2(1270) f_2(1270)$		$(9.5 \pm 1.7) \times 10^{-4}$		878
$\gamma f_2(1270) f_2(1270)$(non resonant)		$(8.2 \pm 1.9) \times 10^{-4}$		–
$\gamma\pi^+\pi^- 2\pi^0$		$(8.3 \pm 3.1) \times 10^{-3}$		1518
$\gamma K^0_S K^0_S$		$(8.1 \pm 0.4) \times 10^{-4}$		1466
$\gamma(K\overline{K}\pi)$ $[J^{PC} = 0^{-+}]$		$(7 \pm 4) \times 10^{-4}$	S=2.1	1442
$\gamma K^+K^-\pi^+\pi^-$		$(2.1 \pm 0.6) \times 10^{-3}$		1407
$\gamma K^*(892)\overline{K}^*(892)$		$(4.0 \pm 1.3) \times 10^{-3}$		1266
$\gamma\eta$		$(1.090 \pm 0.013) \times 10^{-3}$		1500
$\gamma\eta\pi^0$		$(2.14 \pm 0.31) \times 10^{-5}$		1497
$\gamma a_0(980)^0 \rightarrow \gamma\eta\pi^0$		$< 2.5 \times 10^{-6}$	CL=95%	–

$\gamma a_2(1320)^0 \to \gamma\eta\pi^0$	< 6.6		$\times 10^{-6}$	CL=95%	–
$\gamma\eta\pi\pi$	$(6.1 \pm 1.0) \times 10^{-3}$				1487
$\gamma\eta_2(1870) \to \gamma\eta\pi^+\pi^-$	$(6.2 \pm 2.4) \times 10^{-4}$				–
$\gamma\eta'(958)$	$(5.28 \pm 0.06) \times 10^{-3}$			S=1.3	1400
$\gamma\rho\rho$	$(4.5 \pm 0.8) \times 10^{-3}$				1340
$\gamma\rho\omega$	< 5.4		$\times 10^{-4}$	CL=90%	1338
$\gamma\rho\phi$	< 8.8		$\times 10^{-5}$	CL=90%	1258
$\gamma\omega\omega$	$(1.61 \pm 0.33) \times 10^{-3}$				1336
$\gamma\phi\phi$	$(4.0 \pm 1.2) \times 10^{-4}$			S=2.1	1166
$\gamma\eta(1405/1475) \to \gamma K\overline{K}\pi$	$(2.8 \pm 0.6) \times 10^{-3}$			S=1.6	1223
$\gamma\eta(1405/1475) \to \gamma\gamma\rho^0$	$(7.8 \pm 2.0) \times 10^{-5}$			S=1.8	1223
$\gamma\eta(1405/1475) \to \gamma\eta\pi^+\pi^-$	$(3.0 \pm 0.5) \times 10^{-4}$				–
$\gamma\eta(1405/1475) \to \gamma\rho^0\rho^0$	$(1.7 \pm 0.4) \times 10^{-3}$			S=1.3	1223
$\gamma\eta(1405/1475) \to \gamma\gamma\phi$	< 8.2		$\times 10^{-5}$	CL=95%	–
$\gamma\eta(1405) \to \gamma f_0(980)\pi^0 \to \gamma\pi^+\pi^-\pi^0$	$(1.50 \pm 0.16) \times 10^{-5}$				–
$\gamma\eta(1405) \to \gamma f_0(980)\pi^0 \to \gamma\pi^0\pi^0\pi^0$	$(7.1 \pm 1.1) \times 10^{-6}$				–
$\gamma\eta(1405) \to \gamma\gamma\gamma$	< 2.63		$\times 10^{-6}$	CL=90%	–
$\gamma\eta(1475) \to \gamma\gamma\gamma$	< 1.86		$\times 10^{-6}$	CL=90%	–
$\gamma\eta(1760) \to \gamma\rho^0\rho^0$	$(1.3 \pm 0.9) \times 10^{-4}$				1048
$\gamma\eta(1760) \to \gamma\omega\omega$	$(1.98 \pm 0.33) \times 10^{-3}$				–
$\gamma\eta(1760) \to \gamma\gamma\gamma$	< 4.80		$\times 10^{-6}$	CL=90%	–
$\gamma\eta(2225)$	$(3.14 {}^{+\,0.50}_{-\,0.19}) \times 10^{-4}$				752
$\gamma f_2(1270)$	$(1.63 \pm 0.12) \times 10^{-3}$			S=1.3	1286
$\gamma f_2(1270) \to \gamma K^0_S K^0_S$	$(2.58 {}^{+\,0.60}_{-\,0.22}) \times 10^{-5}$				–
$\gamma f_1(1285)$	$(6.1 \pm 0.8) \times 10^{-4}$				1283
$\gamma f_0(1370) \to \gamma K\overline{K}$	$(4.2 \pm 1.5) \times 10^{-4}$				–
$\gamma f_0(1370) \to \gamma K^0_S K^0_S$	$(1.1 \pm 0.4) \times 10^{-5}$				–
$\gamma f_1(1420) \to \gamma K\overline{K}\pi$	$(7.9 \pm 1.3) \times 10^{-4}$				1220
$\gamma f_0(1500) \to \gamma\pi\pi$	$(1.09 \pm 0.24) \times 10^{-4}$				1183
$\gamma f_0(1500) \to \gamma\eta\eta$	$(1.7 {}^{+\,0.6}_{-\,1.4}) \times 10^{-5}$				–
$\gamma f_0(1500) \to \gamma K^0_S K^0_S$	$(1.59 {}^{+\,0.24}_{-\,0.60}) \times 10^{-5}$				–
$\gamma f_1(1510) \to \gamma\eta\pi^+\pi^-$	$(4.5 \pm 1.2) \times 10^{-4}$				–
$\gamma f'_2(1525)$	$(5.7 {}^{+\,0.8}_{-\,0.5}) \times 10^{-4}$			S=1.5	1177
$\gamma f'_2(1525) \to \gamma K^0_S K^0_S$	$(8.0 {}^{+\,0.7}_{-\,0.5}) \times 10^{-5}$				–
$\gamma f'_2(1525) \to \gamma\eta\eta$	$(3.4 \pm 1.4) \times 10^{-5}$				–
$\gamma f_2(1640) \to \gamma\omega\omega$	$(2.8 \pm 1.8) \times 10^{-4}$				–
$\gamma f_0(1710) \to \gamma\pi\pi$	$(3.8 \pm 0.5) \times 10^{-4}$				–
$\gamma f_0(1710) \to \gamma K\overline{K}$	$(9.5 {}^{+\,1.0}_{-\,0.5}) \times 10^{-4}$			S=1.5	1075

$\gamma f_0(1710) \to \gamma\omega\omega$	$(\ 3.1 \pm 1.0\ ) \times 10^{-4}$			–
$\gamma f_0(1710) \to \gamma\eta\eta$	$(\ 2.4\ ^{+\ 1.2}_{-\ 0.7}\ ) \times 10^{-4}$			–
$\gamma f_0(1710) \to \gamma\omega\phi$	$(\ 2.5 \pm 0.6\ ) \times 10^{-4}$			–
$\gamma f_0(1770) \to \gamma K^0_S K^0_S$	$(\ 1.11\ ^{+\ 0.20}_{-\ 0.33}\ ) \times 10^{-5}$			–
$\gamma f_2(1810) \to \gamma\eta\eta$	$(\ 5.4\ ^{+\ 3.5}_{-\ 2.4}\ ) \times 10^{-5}$			–
$\gamma \eta_1(1855) \to \gamma\eta\eta'$	$(\ 2.7\ ^{+\ 0.4}_{-\ 0.5}\ ) \times 10^{-6}$			–
$\gamma f_2(1910) \to \gamma\omega\omega$	$(\ 2.0 \pm 1.4\ ) \times 10^{-4}$			–
$\gamma f_2(1950) \to \gamma K^*(892)\overline{K}^*(892)$	$(\ 7.0 \pm 2.2\ ) \times 10^{-4}$			–
$\gamma f_0(2020) \to \gamma\eta'\eta'$	$(\ 2.63\ ^{+\ 0.32}_{-\ 0.50}\ ) \times 10^{-4}$			–
$\gamma f_4(2050)$	$(\ 2.7 \pm 0.7\ ) \times 10^{-3}$			891
$\gamma f_0(2100) \to \gamma\eta\eta$	$(\ 1.13\ ^{+\ 0.60}_{-\ 0.30}\ ) \times 10^{-4}$			–
$\gamma f_0(2100) \to \gamma\pi\pi$	$(\ 6.2 \pm 1.0\ ) \times 10^{-4}$			–
$\gamma f_0(2200)$	seen			776
$\gamma f_0(2200) \to \gamma K\overline{K}$	$(\ 5.9 \pm 1.3\ ) \times 10^{-4}$			–
$\gamma f_0(2200) \to \gamma K^0_S K^0_S$	$(\ 2.72\ ^{+\ 0.19}_{-\ 0.50}\ ) \times 10^{-4}$			–
$\gamma f_J(2220)$	seen			745
$\gamma f_J(2220) \to \gamma\pi\pi$	$< 3.9 \times 10^{-5}$		CL=90%	–
$\gamma f_J(2220) \to \gamma K\overline{K}$	$< 4.1 \times 10^{-5}$		CL=90%	–
$\gamma f_J(2220) \to \gamma p\overline{p}$	$(\ 1.5 \pm 0.8\ ) \times 10^{-5}$			–
$\gamma f_0(2330) \to \gamma K^0_S K^0_S$	$(\ 4.9 \pm 0.7\ ) \times 10^{-5}$			–
$\gamma f_0(2330) \to \gamma\eta'\eta'$	$(\ 6.1\ ^{+\ 4.0}_{-\ 1.8}\ ) \times 10^{-6}$			–
$\gamma f_2(2340) \to \gamma\eta\eta$	$(\ 5.6\ ^{+\ 2.4}_{-\ 2.2}\ ) \times 10^{-5}$			–
$\gamma f_2(2340) \to \gamma K^0_S K^0_S$	$(\ 5.5\ ^{+\ 4.0}_{-\ 1.5}\ ) \times 10^{-5}$			–
$\gamma f_2(2340) \to \gamma\eta'\eta'$	$(\ 8.7\ ^{+\ 0.9}_{-\ 1.8}\ ) \times 10^{-6}$			–
$\gamma f_0(2470) \to \gamma\eta'\eta'$	$(\ 8.2\ ^{+\ 4.0}_{-\ 2.8}\ ) \times 10^{-7}$			–
$\gamma X(1835) \to \gamma\pi^+\pi^-\eta'$	$(\ 2.7\ ^{+\ 0.6}_{-\ 0.8}\ ) \times 10^{-4}$		S=1.6	1006
$\gamma X(1835) \to \gamma p\overline{p}$	$(\ 7.7\ ^{+\ 1.5}_{-\ 0.9}\ ) \times 10^{-5}$			–
$\gamma X(1835) \to \gamma K^0_S K^0_S \eta$	$(\ 3.3\ ^{+\ 2.0}_{-\ 1.3}\ ) \times 10^{-5}$			–
$\gamma X(1835) \to \gamma\gamma\gamma$	$< 3.56 \times 10^{-6}$		CL=90%	–
$\gamma X(1835) \to \gamma 3(\pi^+\pi^-)$	$(\ 2.4\ ^{+\ 0.7}_{-\ 0.8}\ ) \times 10^{-5}$			–
$\gamma \eta(2370) \to \gamma K^+ K^- \eta'$	$(\ 1.8 \pm 0.7\ ) \times 10^{-5}$			–
$\gamma \eta(2370) \to \gamma K^0_S K^0_S \eta'$	$(\ 1.2 \pm 0.5\ ) \times 10^{-5}$			–
$\gamma \eta(2370) \to \gamma\eta\eta\eta'$	$< 9.2 \times 10^{-6}$		CL=90%	–

$\gamma D^0 +$c.c.		$<$ 9.1		$\times 10^{-8}$	CL=90%	987
$\gamma p\overline{p}$		(3.8	$\pm$ 1.0)	$\times 10^{-4}$		1232
$\gamma p\overline{p}\pi^+\pi^-$		$<$ 7.9		$\times 10^{-4}$	CL=90%	1107
$\gamma\Lambda\overline{\Lambda}$		$<$ 1.3		$\times 10^{-4}$	CL=90%	1074
$\gamma A^0 \rightarrow \gamma$ invisible	[e]	$<$ 1.7		$\times 10^{-6}$	CL=90%	–
$\gamma A^0 \rightarrow \gamma\gamma\gamma$		$<$ 4.9		$\times 10^{-7}$	CL=95%	–
$\gamma A^0 \rightarrow \gamma\mu^+\mu^-$	[f]	$<$ 7.8		$\times 10^{-7}$	CL=90%	–

Dalitz decays

$\pi^0 e^+ e^-$		(7.6	$\pm$ 1.4)	$\times 10^{-7}$		1546
$\eta e^+ e^-$		(1.42	$\pm$ 0.08)	$\times 10^{-5}$		1500
$\eta'(958) e^+ e^-$		(6.59	$\pm$ 0.18)	$\times 10^{-5}$		1400
$\eta(1405) e^+ e^- \rightarrow f_0(980)\pi^0 e^+ e^- \rightarrow \pi^+\pi^-\pi^0 e^+ e^-$		(2.04	$\pm$ 0.22)	$\times 10^{-7}$		–
$X(1835) e^+ e^-,\ X \rightarrow \pi^+\pi^-\eta'$		(3.58	$\pm$ 0.25)	$\times 10^{-6}$		–
$X(2120) e^+ e^-,\ X \rightarrow \pi^+\pi^-\eta'$		(8.2	$\pm$ 1.3)	$\times 10^{-7}$		–
$\eta(2370) e^+ e^-,\ \eta \rightarrow \pi^+\pi^-\eta'$		(1.08	$\pm$ 0.17)	$\times 10^{-6}$		–
$\eta U \rightarrow \eta e^+ e^-$	[g]	$<$ 9.11		$\times 10^{-7}$	CL=90%	–
$\eta'(958) U \rightarrow \eta'(958) e^+ e^-$	[g]	$<$ 2.0		$\times 10^{-7}$	CL=90%	–
$\phi e^+ e^-$		$<$ 1.2		$\times 10^{-7}$	CL=90%	1381

Weak decays

$D^- e^+ \nu_e +$ c.c.	$<$ 7.1		$\times 10^{-8}$	CL=90%	984
$D^- \mu^+ \nu_\mu +$ c.c.	$<$ 5.6		$\times 10^{-7}$	CL=90%	980
$\overline{D}^0 e^+ e^- +$ c.c.	$<$ 8.5		$\times 10^{-8}$	CL=90%	987
$D_s^- e^+ \nu_e +$ c.c.	$<$ 1.3		$\times 10^{-6}$	CL=90%	923
$D_s^{*-} e^+ \nu_e +$ c.c.	$<$ 1.8		$\times 10^{-6}$	CL=90%	828
$D^- \pi^+ +$ c.c.	$<$ 7.0		$\times 10^{-8}$	CL=90%	977
$D^- \rho^+ +$ c.c	$<$ 6.0		$\times 10^{-7}$	CL=90%	–
$\overline{D}^0 \pi^0 +$ c.c	$<$ 4.7		$\times 10^{-7}$	CL=90%	–
$\overline{D}^0 \overline{K}^0 +$ c.c.	$<$ 1.7		$\times 10^{-4}$	CL=90%	898
$\overline{D}^0 \overline{K}^{*0} +$ c.c.	$<$ 2.5		$\times 10^{-6}$	CL=90%	670
$\overline{D}^0 \eta +$ c.c	$<$ 6.8		$\times 10^{-7}$	CL=90%	–
$\overline{D}^0 \rho^0 +$ c.c	$<$ 5.2		$\times 10^{-7}$	CL=90%	–
$D_s^- \pi^+ +$ c.c.	$<$ 1.3		$\times 10^{-4}$	CL=90%	915
$D_s^- \rho^+ +$ c.c.	$<$ 1.3		$\times 10^{-5}$	CL=90%	663

Charge conjugation (C), Parity (P), Lepton Family number (LF) violating modes

$\gamma\gamma$	C	$<$ 2.7		$\times 10^{-7}$	CL=90%	1548
$\gamma\phi$	C	$<$ 1.4		$\times 10^{-6}$	CL=90%	1381
$e^\pm \mu^\mp$	LF	$<$ 1.6		$\times 10^{-7}$	CL=90%	1547

$e^{\pm}\tau^{\mp}$	LF	< 7.5	$\times 10^{-8}$	CL=90%	1039
$\mu^{\pm}\tau^{\mp}$	LF	< 2.0	$\times 10^{-6}$	CL=90%	1035
$\Lambda_c^+ e^-$ +c.c.		< 6.9	$\times 10^{-8}$	CL=90%	704
Other decays					
invisible		< 7	$\times 10^{-4}$	CL=90%	–

$\chi_{c0}(1P)$

$I^G(J^{PC}) = 0^+(0^{++})$

Mass $m = 3414.71 \pm 0.30$ MeV
Full width $\Gamma = 10.9 \pm 0.6$ MeV (S = 1.1)

$\chi_{c0}(1P)$ DECAY MODES	Fraction (Γ_i/Γ)	Scale factor/ Confidence level	p (MeV/c)
Hadronic decays			
$2(\pi^+\pi^-)$	(2.18±0.11) %	S=1.2	1679
$\rho^0\pi^+\pi^-$	$(8.5 \pm 2.7) \times 10^{-3}$		1607
$f_0(980)f_0(980)$	$(6.7 \pm 2.1) \times 10^{-4}$		1391
$\pi^+\pi^-\pi^0\pi^0$	(3.3 ±0.4) %		1680
$\rho^+\pi^-\pi^0$ + c.c.	(2.9 ±0.4) %		1607
$4\pi^0$	$(3.3 \pm 0.4) \times 10^{-3}$		1681
$\pi^+\pi^-K^+K^-$	(1.81±0.16) %	S=1.2	1580
$K_0^*(1430)^0\overline{K}_0^*(1430)^0 \to \pi^+\pi^-K^+K^-$	$(9.9\ ^{+4.0}_{-2.8}) \times 10^{-4}$		–
$K_0^*(1430)^0\overline{K}_2^*(1430)^0$ + c.c. $\to \pi^+\pi^-K^+K^-$	$(8.0\ ^{+2.0}_{-2.4}) \times 10^{-4}$		–
$K_1(1270)^+K^-$ + c.c. $\to \pi^+\pi^-K^+K^-$	$(6.3 \pm 1.9) \times 10^{-3}$		–
$K_1(1400)^+K^-$ + c.c. $\to \pi^+\pi^-K^+K^-$	$< 2.7 \times 10^{-3}$	CL=90%	–
$f_0(980)f_0(980)$	$(1.6\ ^{+1.0}_{-0.9}) \times 10^{-4}$		1391
$f_0(980)f_0(2200)$	$(8.0\ ^{+2.0}_{-2.5}) \times 10^{-4}$		586
$f_0(1370)f_0(1370)$	$< 2.7 \times 10^{-4}$	CL=90%	1019
$f_0(1370)f_0(1500)$	$< 1.7 \times 10^{-4}$	CL=90%	907
$f_0(1370)f_0(1710)$	$(6.7\ ^{+3.5}_{-2.3}) \times 10^{-4}$		709
$f_0(1500)f_0(1370)$	$< 1.3 \times 10^{-4}$	CL=90%	907
$f_0(1500)f_0(1500)$	$< 5 \times 10^{-5}$	CL=90%	774
$f_0(1500)f_0(1710)$	$< 7 \times 10^{-5}$	CL=90%	515
$K^+K^-\pi^+\pi^-\pi^0$	$(8.6 \pm 0.9) \times 10^{-3}$		1545
$K_S^0K^{\pm}\pi^{\mp}\pi^+\pi^-$	$(4.2 \pm 0.4) \times 10^{-3}$		1543
$K^+K^-\pi^0\pi^0$	$(5.6 \pm 0.9) \times 10^{-3}$		1582
$K^+\pi^-\overline{K}^0\pi^0$ + c.c.	(2.50±0.33) %		1581

$\rho^+ K^- K^0 +$ c.c.	(1.21 ± 0.21) %		1458
$K^*(892)^- K^+ \pi^0 \rightarrow K^+ \pi^- \overline{K}^0 \pi^0 +$ c.c.	$(4.6 \pm 1.2) \times 10^{-3}$		–
$K^0_S K^0_S \pi^+ \pi^-$	$(5.7 \pm 1.1) \times 10^{-3}$		1579
$K^+ K^- \eta \pi^0$	$(3.0 \pm 0.7) \times 10^{-3}$		1468
$3(\pi^+ \pi^-)$	(1.96 ± 0.22) %	S=3.4	1633
$K^+ \overline{K}^*(892)^0 \pi^- +$ c.c.	$(7.4 \pm 1.6) \times 10^{-3}$		1523
$K^*(892)^0 \overline{K}^*(892)^0$	$(1.7 \pm 0.6) \times 10^{-3}$		1456
$\pi \pi$	$(8.6 \pm 0.4) \times 10^{-3}$	S=1.2	1702
$\pi^0 \eta$	$< 1.8 \times 10^{-4}$		1661
$\pi^0 \eta'$	$< 1.1 \times 10^{-3}$		1570
$\pi^0 \eta_c$	$< 1.6 \times 10^{-3}$	CL=90%	383
$\eta \eta$	$(3.02 \pm 0.25) \times 10^{-3}$	S=1.3	1617
$\eta \eta'$	$(9.1 \pm 1.1) \times 10^{-5}$		1521
$\eta' \eta'$	$(2.18 \pm 0.12) \times 10^{-3}$		1413
$\omega \omega$	$(9.7 \pm 1.1) \times 10^{-4}$		1517
$\omega \phi$	$(1.42 \pm 0.13) \times 10^{-4}$		1447
$\omega K^+ K^-$	$(1.94 \pm 0.21) \times 10^{-3}$		1457
$K^+ K^-$	$(6.07 \pm 0.33) \times 10^{-3}$	S=1.1	1634
$K^0_S K^0_S$	$(3.18 \pm 0.19) \times 10^{-3}$	S=1.1	1633
$\pi^+ \pi^- \eta$	$< 2.0 \times 10^{-4}$	CL=90%	1651
$\pi^+ \pi^- \eta'$	$< 4 \times 10^{-4}$	CL=90%	1560
$\overline{K}^0 K^+ \pi^- +$ c.c.	$< 9 \times 10^{-5}$	CL=90%	1610
$K^+ K^- \pi^0$	$< 6 \times 10^{-5}$	CL=90%	1611
$K^+ K^- \eta$	$< 2.3 \times 10^{-4}$	CL=90%	1512
$K^+ K^- K^0_S K^0_S$	$(1.4 \pm 0.5) \times 10^{-3}$		1331
$K^0_S K^0_S K^0_S K^0_S$	$(5.8 \pm 0.5) \times 10^{-4}$		1327
$K^+ K^- K^+ K^-$	$(2.8 \pm 0.4) \times 10^{-3}$	S=1.5	1333
$K^+ K^- \phi$	$(9.7 \pm 2.5) \times 10^{-4}$		1381
$\overline{K}^0 K^+ \pi^- \phi +$ c.c.	$(3.7 \pm 0.6) \times 10^{-3}$		1326
$K^+ K^- \pi^0 \phi$	$(1.90 \pm 0.35) \times 10^{-3}$		1329
$3(K^+ K^-)$	$(1.08 \pm 0.22) \times 10^{-5}$		693
$\phi \pi^+ \pi^- \pi^0$	$(1.18 \pm 0.15) \times 10^{-3}$		1525
$\phi \phi$	$(8.48 \pm 0.31) \times 10^{-4}$		1370
$\phi \phi \eta$	$(8.4 \pm 1.0) \times 10^{-4}$		1100
$p \overline{p}$	$(2.21 \pm 0.14) \times 10^{-4}$	S=1.6	1426
$p \overline{p} \pi^0$	$(7.0 \pm 0.7) \times 10^{-4}$	S=1.3	1379
$p \overline{p} \eta$	$(3.6 \pm 0.4) \times 10^{-4}$		1187
$p \overline{p} \omega$	$(5.3 \pm 0.6) \times 10^{-4}$		1043
$p \overline{p} \phi$	$(6.0 \pm 1.4) \times 10^{-5}$		876
$p \overline{p} \pi^+ \pi^-$	$(2.1 \pm 0.7) \times 10^{-3}$	S=1.4	1320
$p \overline{p} \pi^0 \pi^0$	$(1.04 \pm 0.28) \times 10^{-3}$		1324
$p \overline{p} K^+ K^-$ (non-resonant)	$(1.22 \pm 0.26) \times 10^{-4}$		890
$p \overline{p} K^0_S K^0_S$	$< 8.8 \times 10^{-4}$	CL=90%	884

$p\overline{p}K^0_S K^-\pi^+$ + c.c.	$(2.6\ \pm0.4\ )\times10^{-5}$		763
$p\overline{n}\pi^-$	$(1.27\pm0.11)\times10^{-3}$		1376
$\overline{p}n\pi^+$	$(1.37\pm0.12)\times10^{-3}$		1376
$p\overline{n}\pi^-\pi^0$	$(2.35\pm0.21)\times10^{-3}$		1321
$\overline{p}n\pi^+\pi^0$	$(2.22\pm0.19)\times10^{-3}$		1321
$\Lambda\overline{\Lambda}$	$(3.61\pm0.16)\times10^{-4}$	S=1.1	1292
$\Lambda\overline{\Lambda}\pi^+\pi^-$	$(1.18\pm0.13)\times10^{-3}$		1153
$\Lambda\overline{\Lambda}\pi^+\pi^-$ (non-resonant)	$<5\times10^{-4}$	CL=90%	1153
$\Sigma(1385)^+\overline{\Lambda}\pi^-$ + c.c.	$<5\times10^{-4}$	CL=90%	1083
$\Sigma(1385)^-\overline{\Lambda}\pi^+$ + c.c.	$<5\times10^{-4}$	CL=90%	1083
$\Lambda\overline{\Lambda}\eta$	$(2.3\ \pm0.4\ )\times10^{-4}$		979
$\Lambda\overline{\Lambda}\omega$	$(2.38\pm0.34)\times10^{-4}$		781
$\Lambda\overline{\Lambda}\phi$	$(3.0\ \pm1.3\ )\times10^{-5}$		499
$K^+\overline{p}\Lambda$ + c.c.	$(1.25\pm0.12)\times10^{-3}$	S=1.3	1132
$nK^0_S\overline{\Lambda}$ + c.c.	$(6.7\ \pm0.5\ )\times10^{-4}$		1129
$K^*(892)^+\overline{p}\Lambda$ + c.c.	$(4.8\ \pm0.9\ )\times10^{-4}$		845
$K^+\overline{p}\Lambda(1520)$ + c.c.	$(3.0\ \pm0.8\ )\times10^{-4}$		859
$\overline{p}\Lambda(1520)K^0_S\pi^+$ + c.c.	$(1.6\ \pm0.7\ )\times10^{-5}$		722
$\Lambda(1520)\overline{\Lambda}(1520)$	$(3.1\ \pm1.2\ )\times10^{-4}$		780
$\Sigma^0\overline{\Sigma}^0$	$(4.70\pm0.32)\times10^{-4}$		1222
$\Sigma^+\overline{p}K^0_S$ + c.c.	$(3.54\pm0.27)\times10^{-4}$		1089
$\Sigma^0\overline{p}K^+$ + c.c.	$(3.05\pm0.20)\times10^{-4}$		1090
$\Sigma^+\overline{\Sigma}^-$	$(4.7\ \pm0.8\ )\times10^{-4}$	S=2.6	1225
$\Sigma^+\overline{\Sigma}^-\eta$	$(1.27\pm0.24)\times10^{-4}$		868
$\Sigma^-\overline{\Sigma}^+$	$(5.2\ \pm0.5\ )\times10^{-4}$		1217
$\Sigma(1385)^+\overline{\Sigma}(1385)^-$	$(1.6\ \pm0.6\ )\times10^{-4}$		1001
$\Sigma(1385)^-\overline{\Sigma}(1385)^+$	$(2.3\ \pm0.7\ )\times10^{-4}$		1001
$K^-\Lambda\overline{\Xi}^+$ + c.c.	$(1.95\pm0.35)\times10^{-4}$		873
$\Xi^0\overline{\Xi}^0$	$(4.5\ \pm0.5\ )\times10^{-4}$	S=1.7	1089
$\Xi^-\overline{\Xi}^+$	$(4.48\pm0.20)\times10^{-4}$		1081
$\Omega^-\overline{\Omega}^+$	$(3.5\ \pm0.6\ )\times10^{-5}$		343
$\eta_c\pi^+\pi^-$	$<7\times10^{-4}$	CL=90%	307

Radiative decays

$\gamma J/\psi(1S)$	(1.41 ± 0.09) %	S=1.7	303
$\gamma\rho^0$	$<9\times10^{-6}$	CL=90%	1619
$\gamma\omega$	$<8\times10^{-6}$	CL=90%	1618
$\gamma\phi$	$<6\times10^{-6}$	CL=90%	1555
$\gamma\gamma$	$(2.06\pm0.10)\times10^{-4}$	S=1.1	1707
$e^+e^-J/\psi(1S)$	$(1.34\pm0.30)\times10^{-4}$		303
$\mu^+\mu^-J/\psi(1S)$	$<1.9\times10^{-5}$	CL=90%	226

$\chi_{c1}(1P)$

$I^G(J^{PC}) = 0^+(1^{++})$

Mass $m = 3510.67 \pm 0.05$ MeV (S = 1.2)
Full width $\Gamma = 0.84 \pm 0.04$ MeV (S = 1.1)

$\chi_{c1}(1P)$ DECAY MODES	Fraction (Γ_i/Γ)	Scale factor/ Confidence level	p (MeV/c)
e^+e^-	$(1.4\ ^{+1.5}_{-1.0}) \times 10^{-7}$		1755
Hadronic decays			
$3(\pi^+\pi^-)$	(1.04±0.16) %	S=4.6	1683
$2(\pi^+\pi^-)$	(7.6 ±2.6) × 10^{-3}		1728
$\pi^+\pi^-\pi^0\pi^0$	(1.19±0.15) %		1729
$\rho^+\pi^-\pi^0$ + c.c.	(1.45±0.24) %		1658
$\rho^0\pi^+\pi^-$	(3.9 ±3.5) × 10^{-3}		1658
$4\pi^0$	(5.4 ±0.8) × 10^{-4}		1729
$\pi^+\pi^-K^+K^-$	(4.5 ±1.0) × 10^{-3}		1632
$K^+K^-\pi^0\pi^0$	(1.12±0.27) × 10^{-3}		1634
$K^+K^-\pi^+\pi^-\pi^0$	(1.15±0.13) %		1598
$K^0_S K^\pm\pi^\mp\pi^+\pi^-$	(7.5 ±0.8) × 10^{-3}		1596
$K^+\pi^-\overline{K}^0\pi^0$ + c.c.	(8.6 ±1.4) × 10^{-3}		1632
$\rho^- K^+\overline{K}^0$ + c.c.	(5.0 ±1.2) × 10^{-3}		1514
$K^*(892)^0\overline{K}^0\pi^0 \to K^+\pi^-\overline{K}^0\pi^0$ + c.c.	(2.3 ±0.6) × 10^{-3}		–
$K^+K^-\eta\pi^0$	(1.12±0.34) × 10^{-3}		1523
$\pi^+\pi^- K^0_S K^0_S$	(6.9 ±2.9) × 10^{-4}		1630
$K^+K^-\eta$	(3.2 ±1.0) × 10^{-4}		1566
$\overline{K}^0 K^+\pi^-$ + c.c.	(7.0 ±0.6) × 10^{-3}	S=1.1	1661
$K^*(892)^0\overline{K}^0$ + c.c.	(1.03±0.15) × 10^{-3}		1602
$K^*(892)^+K^-$ + c.c.	(1.21±0.23) × 10^{-3}		1602
$K^*_J(1430)^0\overline{K}^0$ + c.c. $\to K^0_S K^+\pi^-$ + c.c.	< 8 × 10^{-4}	CL=90%	–
$K^*_J(1430)^+K^-$ + c.c. $\to K^0_S K^+\pi^-$ + c.c.	< 2.1 × 10^{-3}	CL=90%	–
$K^+K^-\pi^0$	(1.81±0.24) × 10^{-3}		1662
$\eta\pi^+\pi^-$	(4.62±0.24) × 10^{-3}		1701
$a_0(980)^+\pi^-$ + c.c. $\to \eta\pi^+\pi^-$	(3.2 ±0.4) × 10^{-3}	S=2.1	–
$a_2(1320)^+\pi^-$ + c.c. $\to \eta\pi^+\pi^-$	(1.76±0.24) × 10^{-4}		–
$a_2(1700)^+\pi^-$ + c.c. $\to \eta\pi^+\pi^-$	(4.6 ±0.7) × 10^{-5}		–
$f_2(1270)\eta \to \eta\pi^+\pi^-$	(3.5 ±0.6) × 10^{-4}		–
$f_4(2050)\eta \to \eta\pi^+\pi^-$	(2.5 ±0.9) × 10^{-5}		–
$\pi_1(1400)^+\pi^-$ + c.c. $\to \eta\pi^+\pi^-$	< 5 × 10^{-5}	CL=90%	–

$\pi_1(1600)^+\pi^-$ + c.c. → $\eta\pi^+\pi^-$	< 1.5	$\times 10^{-5}$	CL=90%	–
$\pi_1(2015)^+\pi^-$ + c.c. → $\eta\pi^+\pi^-$	< 8	$\times 10^{-6}$	CL=90%	–
$f_2(1270)\eta$	(6.7 ±1.1)	$\times 10^{-4}$		1467
$\pi^+\pi^-\eta'$	(2.2 ±0.4)	$\times 10^{-3}$		1612
$K^+K^-\eta'(958)$	(8.8 ±0.9)	$\times 10^{-4}$		1461
$K_0^*(1430)^+K^-$ + c.c.	(6.4 $^{+2.2}_{-2.8}$)	$\times 10^{-4}$		–
$f_0(980)\eta'(958)$	(1.6 $^{+1.4}_{-0.7}$)	$\times 10^{-4}$		1460
$f_0(1710)\eta'(958)$	(7 $^{+7}_{-5}$)	$\times 10^{-5}$		1100
$f_2'(1525)\eta'(958)$	(9 ±6)	$\times 10^{-5}$		1229
$K_2^*(1430)^+K^-$ + c.c.	(1.61±0.31)	$\times 10^{-3}$		1416
$K_2^*(1430)\overline{K}^0$ + c.c.	(1.17±0.20)	$\times 10^{-3}$		1416
$\pi^0 f_0(980) \to \pi^0\pi^+\pi^-$	(3.5 ±0.9)	$\times 10^{-7}$		–
$K^+\overline{K}^*(892)^0\pi^-$ + c.c.	(3.2 ±2.1)	$\times 10^{-3}$		1577
$K^*(892)^0\overline{K}^*(892)^0$	(1.4 ±0.4)	$\times 10^{-3}$		1512
$K^+K^-K_S^0K_S^0$	< 4	$\times 10^{-4}$	CL=90%	1390
$K_S^0K_S^0K_S^0K_S^0$	(3.5 ±1.0)	$\times 10^{-5}$		1387
$K^+K^-K^+K^-$	(5.4 ±1.1)	$\times 10^{-4}$		1393
$K^+K^-\phi$	(4.1 ±1.5)	$\times 10^{-4}$		1440
$\overline{K}^0K^+\pi^-\phi$ + c.c.	(3.3 ±0.5)	$\times 10^{-3}$		1387
$K^+K^-\pi^0\phi$	(1.62±0.30)	$\times 10^{-3}$		1390
$3(K^+K^-)$	(4.2 ±1.1)	$\times 10^{-6}$		779
$\phi\pi^+\pi^-\pi^0$	(7.5 ±1.0)	$\times 10^{-4}$		1578
$\omega\omega$	(5.7 ±0.7)	$\times 10^{-4}$		1571
ωK^+K^-	(7.8 ±0.9)	$\times 10^{-4}$		1513
$\omega\phi$	(2.7 ±0.4)	$\times 10^{-5}$		1503
$\phi\phi$	(4.26±0.21)	$\times 10^{-4}$		1429
$\phi\phi\eta$	(3.0 ±0.5)	$\times 10^{-4}$		1172
$p\overline{p}$	(7.6 ±0.4)	$\times 10^{-5}$	S=1.2	1484
$p\overline{p}\pi^0$	(1.55±0.18)	$\times 10^{-4}$		1438
$p\overline{p}\eta$	(1.45±0.25)	$\times 10^{-4}$		1254
$p\overline{p}\omega$	(2.12±0.31)	$\times 10^{-4}$		1117
$p\overline{p}\phi$	< 1.7	$\times 10^{-5}$	CL=90%	962
$p\overline{p}\pi^+\pi^-$	(5.0 ±1.9)	$\times 10^{-4}$		1381
$p\overline{p}\pi^0\pi^0$	< 5	$\times 10^{-4}$	CL=90%	1385
$p\overline{p}K^+K^-$(non-resonant)	(1.27±0.22)	$\times 10^{-4}$		974
$p\overline{p}K_S^0K_S^0$	< 4.5	$\times 10^{-4}$	CL=90%	968
$p\overline{p}K_S^0K^-\pi^+$ + c.c.	(4.2 ±0.5)	$\times 10^{-5}$		857
$p\overline{n}\pi^-$	(3.8 ±0.5)	$\times 10^{-4}$		1435
$\overline{p}n\pi^+$	(3.9 ±0.5)	$\times 10^{-4}$		1435
$p\overline{n}\pi^-\pi^0$	(1.03±0.12)	$\times 10^{-3}$		1383

$\overline{p}n\pi^+\pi^0$	$(1.01\pm0.12)\times10^{-3}$		1383
$\Lambda\overline{\Lambda}$	$(1.27\pm0.09)\times10^{-4}$	S=1.1	1355
$\Lambda\overline{\Lambda}\pi^+\pi^-$	$(2.9\pm0.5)\times10^{-4}$		1223
$\Lambda\overline{\Lambda}\pi^+\pi^-$ (non-resonant)	$(2.5\pm0.6)\times10^{-4}$		1223
$\Sigma(1385)^+\overline{\Lambda}\pi^-$ + c.c.	$<1.3\times10^{-4}$	CL=90%	1157
$\Sigma(1385)^-\overline{\Lambda}\pi^+$ + c.c.	$<1.3\times10^{-4}$	CL=90%	1157
$\Lambda\overline{\Lambda}\eta$	$(5.9\pm1.5)\times10^{-5}$		1059
$\Lambda\overline{\Lambda}\omega$	$(1.01\pm0.16)\times10^{-4}$		877
$\Lambda\overline{\Lambda}\phi$	$(6.0\pm1.0)\times10^{-5}$		634
$K^+\overline{p}\Lambda$+c.c.	$(4.2\pm0.4)\times10^{-4}$	S=1.2	1203
$nK^0_S\overline{\Lambda}$ + c.c.	$(1.66\pm0.17)\times10^{-4}$		1200
$\overline{p}\Lambda(1520)K^0_S\pi^+$ + c.c.	$(4.1\pm0.9)\times10^{-5}$		829
$K^*(892)^+\overline{p}\Lambda$ + c.c.	$(4.9\pm0.7)\times10^{-4}$		935
$K^+\overline{p}\Lambda(1520)$ + c.c.	$(1.7\pm0.4)\times10^{-4}$		951
$\Lambda(1520)\overline{\Lambda}(1520)$	$<9\times10^{-5}$	CL=90%	880
$\Sigma^0\overline{\Sigma}^0$	$(4.2\pm0.6)\times10^{-5}$		1288
$\Sigma^+\overline{p}K^0_S$ + c.c.	$(1.53\pm0.12)\times10^{-4}$		1163
$\Sigma^0\overline{p}K^+$ + c.c.	$(1.46\pm0.10)\times10^{-4}$		1163
$\Sigma^+\overline{\Sigma}^-$	$(3.6\pm0.7)\times10^{-5}$		1291
$\Sigma^+\overline{\Sigma}^-\eta$	$(5.1\pm1.4)\times10^{-5}$		958
$\Sigma^-\overline{\Sigma}^+$	$(5.7\pm1.5)\times10^{-5}$		1283
$\Sigma(1385)^+\overline{\Sigma}(1385)^-$	$<9\times10^{-5}$	CL=90%	1081
$\Sigma(1385)^-\overline{\Sigma}(1385)^+$	$<5\times10^{-5}$	CL=90%	1081
$K^-\Lambda\overline{\Xi}^+$ + c.c.	$(1.35\pm0.24)\times10^{-4}$		963
$\Xi^0\overline{\Xi}^0$	$(7.5\pm1.3)\times10^{-5}$		1163
$\Xi^-\overline{\Xi}^+$	$(6.0\pm0.6)\times10^{-5}$		1155
$\Omega^-\overline{\Omega}^+$	$(1.49\pm0.25)\times10^{-5}$		533
$\pi^+\pi^- + K^+K^-$	$<2.1\times10^{-3}$		–
$K^0_SK^0_S$	$<6\times10^{-5}$	CL=90%	1683
$\eta_c\pi^+\pi^-$	$<3.2\times10^{-3}$	CL=90%	413

Radiative decays

$\gamma J/\psi(1S)$	(34.3 ±1.3) %	S=1.3	389
$\gamma\rho^0$	$(2.16\pm0.17)\times10^{-4}$		1670
$\gamma\omega$	$(6.8\pm0.8)\times10^{-5}$		1668
$\gamma\phi$	$(2.4\pm0.5)\times10^{-5}$		1607
$\gamma\gamma$	$<6.3\times10^{-6}$	CL=90%	1755
$e^+e^-J/\psi(1S)$	$(3.46\pm0.24)\times10^{-3}$		389
$\mu^+\mu^-J/\psi(1S)$	$(2.33\pm0.29)\times10^{-4}$		335

$h_c(1P)$

$I^G(J^{PC}) = 0^-(1^{+-})$

Mass $m = 3525.37 \pm 0.14$ MeV (S = 1.2)
Full width $\Gamma = 0.78 \pm 0.28$ MeV

$h_c(1P)$ DECAY MODES	Fraction (Γ_i/Γ)	Confidence level	p (MeV/c)
$J/\psi(1S)\pi^0$	$< 5 \times 10^{-4}$	90%	382
$J/\psi(1S)\pi\pi$	$< 9 \times 10^{-5}$	90%	312
$J/\psi(1S)\pi^+\pi^-$	$< 9 \times 10^{-4}$	90%	305
$p\overline{p}$	$< 4 \times 10^{-5}$	90%	1492
$p\overline{p}\pi^0$	$< 8 \times 10^{-4}$	90%	1447
$p\overline{p}\pi^+\pi^-$	$(3.3 \pm 0.6) \times 10^{-3}$		1390
$p\overline{p}\pi^0\pi^0$	$< 6 \times 10^{-4}$	90%	1394
$p\overline{p}\pi^+\pi^-\pi^0$	$(4.4 \pm 1.3) \times 10^{-3}$		1331
$p\overline{p}\eta$	$(7.4 \pm 2.2) \times 10^{-4}$		1264
$\pi^+\pi^-\pi^0$	$(1.57 \pm 0.13) \times 10^{-3}$		1749
$\pi^+\pi^-\eta$	$< 5 \times 10^{-4}$	90%	1709
$\pi^+\pi^-\pi^0\eta$	$(8.3 \pm 2.4) \times 10^{-3}$		1695
$2\pi^+2\pi^-\pi^0\eta$	$(7.2 \pm 1.7) \times 10^{-3}$		1648
$2\pi^+2\pi^-\pi^0$	$(9.4 \pm 1.7) \times 10^{-3}$		1716
$2\pi^+2\pi^-\eta$	$< 6 \times 10^{-4}$	90%	1674
$3\pi^+3\pi^-\pi^0$	$(9.1 \pm 1.5) \times 10^{-3}$		1661
$2\pi^+2\pi^-\omega$	$(3.9 \pm 1.0) \times 10^{-3}$		1627
$K^+K^-\pi^+\pi^-$	$< 7 \times 10^{-4}$	90%	1640
$K^+K^-\pi^+\pi^-\pi^0$	$(3.8 \pm 0.8) \times 10^{-3}$		1606
$K^+K^-\pi^+\pi^-\eta$	$< 2.7 \times 10^{-3}$	90%	1480
$K^+K^-\pi^0$	$(3.8 \pm 0.9) \times 10^{-4}$		1670
$K^+K^-\pi^0\eta$	$< 2.4 \times 10^{-3}$	90%	1532
$K^+K^-\eta$	$(3.6 \pm 1.2) \times 10^{-4}$		1574
$2K^+2K^-\pi^0$	$< 2.8 \times 10^{-4}$	90%	1339
$K^0_S K^\pm\pi^\mp$	$(7.1 \pm 1.9) \times 10^{-4}$		1668
$K^0_S K^\pm\pi^\mp\pi^+\pi^-$	$(3.2 \pm 1.0) \times 10^{-3}$		1604
Radiative decays			
$\gamma\eta$	$(3.8 \pm 0.6) \times 10^{-4}$		1720
$\gamma\eta'(958)$	$(1.41 \pm 0.15) \times 10^{-3}$		1633
$\gamma\pi^0$	$< 5 \times 10^{-5}$		1760
$\gamma\eta_c(1S)$	$(60 \pm 4)\%$		500
$e^+e^-\eta_c(1S)$	$(3.5 \pm 0.7) \times 10^{-3}$		500

$\chi_{c2}(1P)$

$I^G(J^{PC}) = 0^+(2^{++})$

Mass $m = 3556.17 \pm 0.07$ MeV
Full width $\Gamma = 1.97 \pm 0.09$ MeV (S = 1.1)

$\chi_{c2}(1P)$ DECAY MODES	Fraction (Γ_i/Γ)	Scale factor/ Confidence level	p (MeV/c)
Hadronic decays			
$2(\pi^+\pi^-)$	(1.12±0.08) %	S=1.5	1751
$\pi^+\pi^-\pi^0\pi^0$	(1.86±0.24) %		1752
$\rho^+\pi^-\pi^0$ + c.c.	(2.22±0.35) %		1682
$4\pi^0$	(1.13±0.15) × 10^{-3}		1752
$K^+K^-\pi^0\pi^0$	(2.1 ±0.4) × 10^{-3}		1658
$K^+\pi^-\overline{K}^0\pi^0$ + c.c.	(1.40±0.20) %		1657
$\rho^-K^+\overline{K}^0$ + c.c.	(4.2 ±1.3) × 10^{-3}		1540
$K^*(892)^0K^-\pi^+ \to K^-\pi^+K^0\pi^0$ + c.c.	(3.0 ±0.8) × 10^{-3}		–
$K^*(892)^0\overline{K}^0\pi^0 \to K^+\pi^-\overline{K}^0\pi^0$ + c.c.	(3.9 ±0.9) × 10^{-3}		–
$K^*(892)^-K^+\pi^0 \to K^+\pi^-\overline{K}^0\pi^0$ + c.c.	(3.8 ±0.8) × 10^{-3}		–
$K^*(892)^+\overline{K}^0\pi^- \to K^+\pi^-\overline{K}^0\pi^0$ + c.c.	(3.0 ±0.8) × 10^{-3}		–
$K^+K^-\eta\pi^0$	(1.3 ±0.4) × 10^{-3}		1549
$K^+K^-\pi^+\pi^-$	(8.4 ±1.1) × 10^{-3}	S=1.2	1656
$K^+K^-\pi^+\pi^-\pi^0$	(1.17±0.13) %		1623
$K^0_SK^\pm\pi^\mp\pi^+\pi^-$	(7.3 ±0.8) × 10^{-3}		1621
$K^+\overline{K}^*(892)^0\pi^-$ + c.c.	(2.1 ±1.0) × 10^{-3}		1602
$K^*(892)^0\overline{K}^*(892)^0$	(2.2 ±0.9) × 10^{-3}	S=2.2	1538
$3(\pi^+\pi^-)$	(1.53±0.19) %	S=3.8	1707
$\phi\phi$	(1.23±0.07) × 10^{-3}	S=1.9	1457
$\phi\phi\eta$	(5.4 ±0.7) × 10^{-4}		1206
$\omega\omega$	(8.6 ±1.0) × 10^{-4}		1597
ωK^+K^-	(7.3 ±0.9) × 10^{-4}		1540
$\omega\phi$	(9.7 ±2.8) × 10^{-6}		1529
$\pi\pi$	(2.26±0.10) × 10^{-3}		1773
$\rho^0\pi^+\pi^-$	(4.0 ±1.7) × 10^{-3}		1682
$\pi^+\pi^-\pi^0$ (non-resonant)	(2.0 ±0.4) × 10^{-5}		1765
$\rho(770)^\pm\pi^\mp$	(6 ±4) × 10^{-6}		–
$\pi^+\pi^-\eta$	(4.9 ±1.3) × 10^{-4}		1724
$\pi^+\pi^-\eta'$	(5.1 ±1.9) × 10^{-4}		1636
$\eta\eta$	(5.5 ±0.4) × 10^{-4}		1692
K^+K^-	(1.02±0.15) × 10^{-3}	S=2.2	1708
$K^0_SK^0_S$	(5.3 ±0.4) × 10^{-4}		1707
$K^*(892)^\pm K^\mp$	(1.46±0.21) × 10^{-4}		1627
$K^*(892)^0\overline{K}^0$ + c.c.	(1.26±0.27) × 10^{-4}		1627
$K^*_2(1430)^\pm K^\mp$	(1.51±0.13) × 10^{-3}		–
$K^*_2(1430)^0\overline{K}^0$ + c.c.	(1.26±0.17) × 10^{-3}		1443
$K^*_3(1780)^\pm K^\mp$	(5.2 ±0.8) × 10^{-4}		–

$K_3^*(1780)^0\overline{K}^0$ + c.c.	$(5.7 \pm 2.1) \times 10^{-4}$		1274
$a_2(1320)^0\pi^0$	$(1.31 \pm 0.35) \times 10^{-3}$		–
$a_2(1320)^\pm\pi^\mp$	$(1.8 \pm 0.6) \times 10^{-3}$		1530
$\overline{K}^0 K^+\pi^-$ + c.c.	$(1.30 \pm 0.19) \times 10^{-3}$		1685
$K^+K^-\pi^0$	$(3.1 \pm 0.8) \times 10^{-4}$		1686
$K^+K^-\eta$	$< 3.3 \times 10^{-4}$	CL=90%	1592
$K^+K^-\eta'(958)$	$(1.94 \pm 0.34) \times 10^{-4}$		1488
$\eta\eta'$	$(2.2 \pm 0.5) \times 10^{-5}$		1600
$\eta'\eta'$	$(4.6 \pm 0.6) \times 10^{-5}$		1498
$\pi^+\pi^- K_S^0 K_S^0$	$(2.2 \pm 0.5) \times 10^{-3}$		1655
$K^+K^- K_S^0 K_S^0$	$< 4 \times 10^{-4}$	CL=90%	1418
$K_S^0 K_S^0 K_S^0 K_S^0$	$(1.15 \pm 0.18) \times 10^{-4}$		1415
$K^+K^-K^+K^-$	$(1.67 \pm 0.22) \times 10^{-3}$	S=1.1	1421
$K^+K^-\phi$	$(1.44 \pm 0.30) \times 10^{-3}$		1468
$\overline{K}^0 K^+\pi^-\phi$ + c.c.	$(4.8 \pm 0.7) \times 10^{-3}$		1416
$K^+K^-\pi^0\phi$	$(2.7 \pm 0.5) \times 10^{-3}$		1419
$3(K^+K^-)$	$(7.2 \pm 1.5) \times 10^{-6}$		818
$\phi\pi^+\pi^-\pi^0$	$(9.3 \pm 1.2) \times 10^{-4}$		1603
$p\overline{p}$	$(7.3 \pm 0.4) \times 10^{-5}$	S=1.1	1510
$p\overline{p}\pi^0$	$(4.7 \pm 0.4) \times 10^{-4}$		1465
$p\overline{p}\eta$	$(1.77 \pm 0.25) \times 10^{-4}$		1285
$p\overline{p}\omega$	$(3.7 \pm 0.4) \times 10^{-4}$		1152
$p\overline{p}\phi$	$(2.8 \pm 0.9) \times 10^{-5}$		1002
$p\overline{p}\pi^+\pi^-$	$(1.32 \pm 0.34) \times 10^{-3}$		1410
$p\overline{p}\pi^0\pi^0$	$(8.0 \pm 2.4) \times 10^{-4}$		1414
$p\overline{p}K^+K^-$(non-resonant)	$(1.94 \pm 0.32) \times 10^{-4}$		1013
$p\overline{p}K_S^0 K_S^0$	$< 7.9 \times 10^{-4}$	CL=90%	1007
$p\overline{p}K_S^0 K^-\pi^+$ + c.c.	$(5.7 \pm 0.6) \times 10^{-5}$		900
$p\overline{n}\pi^-$	$(8.7 \pm 1.0) \times 10^{-4}$		1463
$\overline{p}n\pi^+$	$(9.1 \pm 0.8) \times 10^{-4}$		1463
$p\overline{n}\pi^-\pi^0$	$(2.21 \pm 0.18) \times 10^{-3}$		1411
$\overline{p}n\pi^+\pi^0$	$(2.14 \pm 0.19) \times 10^{-3}$		1411
$\Lambda\overline{\Lambda}$	$(1.86 \pm 0.16) \times 10^{-4}$		1384
$\Lambda\overline{\Lambda}\pi^+\pi^-$	$(1.27 \pm 0.16) \times 10^{-3}$		1255
$\Lambda\overline{\Lambda}\pi^+\pi^-$(non-resonant)	$(6.7 \pm 1.5) \times 10^{-4}$		1255
$\Sigma(1385)^+\overline{\Lambda}\pi^-$ + c.c.	$< 4 \times 10^{-4}$	CL=90%	1192
$\Sigma(1385)^-\overline{\Lambda}\pi^+$ + c.c.	$< 6 \times 10^{-4}$	CL=90%	1192
$\Lambda\overline{\Lambda}\eta$	$(1.07 \pm 0.26) \times 10^{-4}$		1096
$\Lambda\overline{\Lambda}\omega$	$(1.42 \pm 0.22) \times 10^{-4}$		921
$\Lambda\overline{\Lambda}\phi$	$(7.2 \pm 0.9) \times 10^{-5}$		691
$K^+\overline{p}\Lambda$ + c.c.	$(7.9 \pm 0.5) \times 10^{-4}$		1236
$nK_S^0\overline{\Lambda}$ + c.c.	$(3.63 \pm 0.29) \times 10^{-4}$		1233
$K^*(892)^+\overline{p}\Lambda$ + c.c.	$(8.3 \pm 1.2) \times 10^{-4}$		976
$K^+\overline{p}\Lambda(1520)$ + c.c.	$(2.9 \pm 0.7) \times 10^{-4}$		992

$\overline{p}\Lambda(1520)K^0_S\pi^+$ + c.c.	(4.1 ±1.0) × 10^{-5}			876
$\Lambda(1520)\overline{\Lambda}(1520)$	(4.7 ±1.5) × 10^{-4}			924
$\Sigma^0\overline{\Sigma}^0$	(3.7 ±0.6) × 10^{-5}			1319
$\Sigma^+\overline{p}K^0_S$ + c.c.	(8.4 ±1.0) × 10^{-5}			1197
$\Sigma^0\overline{p}K^+$ + c.c.	(9.3 ±0.8) × 10^{-5}			1197
$\Sigma^+\overline{\Sigma}^-$	(3.4 ±0.7) × 10^{-5}			1322
$\Sigma^+\overline{\Sigma}^-\eta$	(5.5 ±1.3) × 10^{-5}			998
$\Sigma^-\overline{\Sigma}^+$	(4.5 ±1.8) × 10^{-5}			1314
$\Sigma(1385)^+\overline{\Sigma}(1385)^-$	< 1.6	× 10^{-4}	CL=90%	1118
$\Sigma(1385)^-\overline{\Sigma}(1385)^+$	< 8	× 10^{-5}	CL=90%	1118
$K^-\Lambda\overline{\Xi}^+$ + c.c.	(1.79±0.32) × 10^{-4}			1004
$\Xi^0\overline{\Xi}^0$	(1.86±0.22) × 10^{-4}			1197
$\Xi^-\overline{\Xi}^+$	(1.46±0.12) × 10^{-4}			1189
$\Omega^-\overline{\Omega}^+$	(4.52±0.30) × 10^{-5}			604
$J/\psi(1S)\pi^+\pi^-\pi^0$	< 1.5	%	CL=90%	185
$\pi^0\eta_c$	< 3.2	× 10^{-3}	CL=90%	511
$\eta_c(1S)\pi^+\pi^-$	< 5.4	× 10^{-3}	CL=90%	459
Radiative decays				
$\gamma J/\psi(1S)$	(19.5 ±0.7) %		S=1.5	430
$\gamma\rho^0$	< 1.9	× 10^{-5}	CL=90%	1694
$\gamma\omega$	< 6	× 10^{-6}	CL=90%	1692
$\gamma\phi$	< 8	× 10^{-6}	CL=90%	1632
$\gamma\gamma$	(2.91±0.12) × 10^{-4}		S=1.3	1778
$e^+e^-J/\psi(1S)$	(2.20±0.15) × 10^{-3}			430
$\mu^+\mu^-J/\psi(1S)$	(2.07±0.34) × 10^{-4}			381

$\eta_c(2S)$

$I^G(J^{PC}) = 0^+(0^{-+})$

Quantum numbers are quark model predictions.

Mass $m = 3637.8 \pm 0.6$ MeV (S = 1.1)
Full width $\Gamma = 11.6 \pm 1.4$ MeV

$\eta_c(2S)$ DECAY MODES	Fraction (Γ_i/Γ)	Confidence level	p (MeV/c)
hadrons	seen		–
$K\overline{K}\pi$	$(1.9^{+1.2}_{-1.0})$ %		1729
$K\overline{K}\eta$	(7 $^{+5}_{-4}$) × 10^{-3}		1637
$2\pi^+2\pi^-$	< 2.6 × 10^{-3}	90%	1792
$a_0(1450)\pi$	seen		1531
$a_2(1700)\pi$	seen		1415
$a_0(1710)\pi$	seen		1412
$\rho^0\rho^0$	< 2.3 × 10^{-3}	90%	1645

$3\pi^+3\pi^-$	$(1.7^{+0.9}_{-1.1})$ %			1749
$K^+K^-\pi^+\pi^-$	< 2.5	$\times 10^{-3}$	90%	1700
$K^{*0}\overline{K}^{*0}$	< 4	$\times 10^{-3}$	90%	1585
$K^+K^-\pi^+\pi^-\pi^0$	$(1.5^{+1.0}_{-0.9})$ %			1668
$K^+K^-2\pi^+2\pi^-$	< 1.8	%	90%	1627
$K^0_S K^-2\pi^+\pi^-$ + c.c.	$(1.4^{+0.8}_{-1.0})$ %			1666
$2K^+2K^-$	< 1.4	$\times 10^{-3}$	90%	1470
$K^*_2(1430)\overline{K}$ + c.c.	seen			1493
$K^*_0(1950)\overline{K}$ + c.c.	seen			1231
$K^*_0(2600)\overline{K}$ + c.c.	seen			–
$\phi\phi$	< 1.4	$\times 10^{-3}$	90%	1506
$p\overline{p}$	< 3.2	$\times 10^{-4}$	90%	1558
$p\overline{p}\pi^+\pi^-$	seen			1461
$\gamma\gamma$	$(1.8^{+1.0}_{-1.1}) \times 10^{-4}$			1819
$\gamma J/\psi(1S)$	< 1.8	%	90%	501
$\pi^+\pi^-\eta$	$(5.5^{+3.3}_{-4.0}) \times 10^{-3}$			1766
$\pi^+\pi^-\eta'$	$(2.7^{+2.0}_{-1.8}) \times 10^{-3}$			1680
$\pi^+\pi^-\eta_c(1S)$	< 4	%	90%	538

$\psi(2S)$

$I^G(J^{PC}) = 0^-(1^{--})$

Mass $m = 3686.097 \pm 0.011$ MeV (S = 1.1)
Full width $\Gamma = 293 \pm 9$ keV (S = 1.2)

$\psi(2S)$ DECAY MODES	Fraction (Γ_i/Γ)	Scale factor/ Confidence level	p (MeV/c)
hadrons	(97.85 ±0.13) %		–
virtual $\gamma \rightarrow$ hadrons	(1.79 ±0.04) %		–
ggg	(10.6 ±1.6) %		–
γgg	(1.03 ±0.29) %		–
light hadrons	(15.4 ±1.5) %		–
K^0_S anything	(16.0 ±1.1) %		–
e^+e^-	(7.94 ±0.22) $\times 10^{-3}$	S=1.3	1843
$\mu^+\mu^-$	(8.0 ±0.6) $\times 10^{-3}$		1840
$\tau^+\tau^-$	(3.1 ±0.4) $\times 10^{-3}$		489
Decays into $J/\psi(1S)$ and anything			
$J/\psi(1S)$ anything	(61.5 ±0.7) %	S=1.3	–
$J/\psi(1S)$ neutrals	(25.4 ±0.5) %	S=1.6	–
$J/\psi(1S)\pi^+\pi^-$	(34.69 ±0.34) %	S=1.1	477

$J/\psi(1S)\pi^0\pi^0$	(18.2 ±0.5) %	S=1.6	481
$J/\psi(1S)\eta$	(3.37 ±0.06) %	S=1.2	199
$J/\psi(1S)\pi^0$	(1.268±0.032) $\times 10^{-3}$		528

Hadronic decays

$\pi^+\pi^-$	(7.8 ±2.6) $\times 10^{-6}$		1838
$\pi^+\pi^-\pi^0$	(2.01 ±0.17) $\times 10^{-4}$	S=1.7	1830
$\rho(770)\pi \rightarrow \pi^+\pi^-\pi^0$	(3.2 ±1.2) $\times 10^{-5}$	S=1.8	–
$\rho(2150)\pi \rightarrow \pi^+\pi^-\pi^0$	(1.9 $^{+1.2}_{-0.4}$) $\times 10^{-4}$		–
$2(\pi^+\pi^-)$	(2.4 ±0.6) $\times 10^{-4}$	S=2.2	1817
$\rho^0\pi^+\pi^-$	(2.2 ±0.6) $\times 10^{-4}$	S=1.4	1750
$2(\pi^+\pi^-)\pi^0$	(2.9 ±1.0) $\times 10^{-3}$	S=4.7	1799
$\rho a_2(1320)$	(2.6 ±0.9) $\times 10^{-4}$		1500
$\pi^+\pi^-\pi^0\pi^0\pi^0$	(5.3 ±1.0) $\times 10^{-3}$		1800
$\rho^\pm\pi^\mp\pi^0\pi^0$	< 2.7 $\times 10^{-3}$	CL=90%	1737
$\pi^+\pi^-4\pi^0$	(1.4 ±1.0) $\times 10^{-3}$		1778
$3(\pi^+\pi^-)$	(3.5 ±2.0) $\times 10^{-4}$	S=2.8	1774
$2(\pi^+\pi^-\pi^0)$	(4.8 ±1.5) $\times 10^{-3}$		1776
$3(\pi^+\pi^-)\pi^0$	(3.5 ±1.6) $\times 10^{-3}$		1746
$2(\pi^+\pi^-)3\pi^0$	(1.42 ±0.31) %		1748
$\eta\pi^+\pi^-$	< 1.6 $\times 10^{-4}$	CL=90%	1791
$\eta\pi^+\pi^-\pi^0$	(9.5 ±1.7) $\times 10^{-4}$		1778
$\eta 2(\pi^+\pi^-)$	(1.2 ±0.6) $\times 10^{-3}$		1758
$\eta\pi^+\pi^-\pi^0\pi^0$	< 4 $\times 10^{-4}$	CL=90%	1760
$\eta\pi^+\pi^-3\pi^0$	< 2.1 $\times 10^{-3}$	CL=90%	1736
$\eta 2(\pi^+\pi^-\pi^0)$	< 2.1 $\times 10^{-3}$	CL=90%	1705
$\rho\eta$	(2.2 ±0.6) $\times 10^{-5}$	S=1.1	1717
$\eta'\pi^+\pi^-\pi^0$	(4.5 ±2.1) $\times 10^{-4}$		1692
$\eta'\rho$	(1.9 $^{+1.7}_{-1.2}$) $\times 10^{-5}$		1625
$\omega\pi^0$	(2.1 ±0.6) $\times 10^{-5}$		1757
$\omega\pi^+\pi^-$	(7.3 ±1.2) $\times 10^{-4}$	S=2.1	1748
$\omega\pi^+\pi^-2\pi^0$	(8.7 ±2.4) $\times 10^{-3}$		1715
$b_1^\pm\pi^\mp$	(4.0 ±0.6) $\times 10^{-4}$	S=1.1	1635
$\omega f_2(1270)$	(2.2 ±0.4) $\times 10^{-4}$		1515
$\omega\pi^0\pi^0$	(1.11 ±0.35) $\times 10^{-3}$		1749
$\omega 3\pi^0$	< 8 $\times 10^{-4}$	CL=90%	1736
$b_1^0\pi^0$	(2.4 ±0.6) $\times 10^{-4}$		–
$\omega\eta$	< 1.1 $\times 10^{-5}$	CL=90%	1715
$\omega\eta'$	(3.2 $^{+2.5}_{-2.1}$) $\times 10^{-5}$		1623
$\phi\pi^0$	< 4 $\times 10^{-7}$	CL=90%	1699
$\phi\pi^+\pi^-$	(1.18 ±0.26) $\times 10^{-4}$	S=1.5	1690
$\phi f_0(980) \rightarrow \pi^+\pi^-$	(7.5 ±3.3) $\times 10^{-5}$	S=1.6	–
$\phi\eta$	(3.10 ±0.31) $\times 10^{-5}$		1654

$\eta\phi(2170),\ \phi(2170) \to$ $\phi f_0(980),\ f_0 \to \pi^+\pi^-$	$<$	2.2		$\times 10^{-6}$	CL=90%	–
$\phi\eta'$	(	1.54	± 0.20)	$\times 10^{-5}$		1555
$\phi\phi\phi$	(	1.46	± 0.18)	$\times 10^{-5}$		989
$\phi f_1(1285)$	(	3.0	± 1.3)	$\times 10^{-5}$		1436
$\phi\eta(1405) \to \phi\pi^+\pi^-\eta$	(	8.5	± 1.7)	$\times 10^{-6}$		–
$\phi f_2'(1525)$	(	4.4	± 1.6)	$\times 10^{-5}$		1325
K^+K^-	(	7.5	± 0.5)	$\times 10^{-5}$		1776
$K^+K^-\pi^+\pi^-$	(	7.3	± 0.5)	$\times 10^{-4}$		1726
$K^+K^-\pi^0$	(	4.07	± 0.31)	$\times 10^{-5}$		1754
$K^0_S K^0_S$	$<$	4.6		$\times 10^{-6}$		1775
$K^0_S K^0_L$	(	5.34	± 0.33)	$\times 10^{-5}$		1775
$K^0_S K^0_L \pi^0$	$<$	3.0		$\times 10^{-4}$	CL=90%	1753
$K^+K^-\pi^0\pi^0$	(	2.6	± 1.3)	$\times 10^{-4}$		1728
$K^+K^-\pi^0\pi^0\pi^0$	(	6.6	± 2.8)	$\times 10^{-4}$		1696
$K^0_S K^\pm\pi^\mp\pi^0\pi^0$	(	1.7	± 0.6)	$\times 10^{-3}$		1694
$K^0_S K^\pm\pi^\mp\pi^+\pi^-$	(	2.2	± 0.4)	$\times 10^{-3}$		1692
$K^+K^-\pi^+\pi^-\pi^0$	(	1.26	± 0.09)	$\times 10^{-3}$		1694
$\omega f_0(1710) \to \omega K^+K^-$	(	5.9	± 2.2)	$\times 10^{-5}$		–
$K^*(892)^0 K^-\pi^+\pi^0$ + c.c.	(	8.6	± 2.2)	$\times 10^{-4}$		–
$K^*(892)^+ K^-\pi^+\pi^-$ + c.c.	(	9.6	± 2.8)	$\times 10^{-4}$		–
$K^*(892)^+ K^-\rho^0$ + c.c.	(	7.3	± 2.6)	$\times 10^{-4}$		–
$K^*(892)^0 K^-\rho^+$ + c.c.	(	6.1	± 1.8)	$\times 10^{-4}$		–
$K^0_S K^0_S \pi^+\pi^-$	(	2.2	± 0.4)	$\times 10^{-4}$		1724
$K^0_S K^0_L \pi^0\pi^0$	(	1.3	± 0.6)	$\times 10^{-3}$		1726
$K^0_S K^*(892)^0\pi^0\pi^0$	(	3.0	± 1.3)	$\times 10^{-4}$		1645
$K^0_S K^\pm\rho(770)^\mp\pi^0$	$<$	7		$\times 10^{-4}$	CL=90%	–
$K^0_S K^\pm\pi^\mp\rho(770)^0$	$<$	7		$\times 10^{-4}$	CL=90%	–
$K^\mp K^*(892)^\pm\pi^0\pi^0$	(	7.0	± 2.9)	$\times 10^{-4}$		1646
$K^*(892)^+ K^*(892)^-\pi^0$	(	3.6	± 1.8)	$\times 10^{-3}$		1573
$K^0_S K^0_L \eta$	(	1.3	± 0.5)	$\times 10^{-3}$		1661
$K^+K^-\rho^0$	(	2.2	± 0.4)	$\times 10^{-4}$		1616
$K^*(892)^0\overline{K}{}^*_2(1430)^0$	(	1.9	± 0.5)	$\times 10^{-4}$		1417
$K^+K^-\pi^+\pi^-\eta$	(	1.3	± 0.7)	$\times 10^{-3}$		1574
$K^+K^-2(\pi^+\pi^-)$	(	1.9	± 0.9)	$\times 10^{-3}$		1654
$K^+K^-2(\pi^+\pi^-)\pi^0$	(	1.00	± 0.31)	$\times 10^{-3}$		1611
$K^+K^*(892)^-$ + c.c.	(	2.9	± 0.4)	$\times 10^{-5}$	S=1.2	1698
$2(K^+K^-)$	(	6.3	± 1.3)	$\times 10^{-5}$		1499
$2(K^+K^-)\pi^0$	(	1.10	± 0.28)	$\times 10^{-4}$		1440
$K^+K^-\phi$	(	7.0	± 1.6)	$\times 10^{-5}$		1546
$K^0_S K^0_S \phi$	(	3.53	± 0.29)	$\times 10^{-5}$		1543
$K_1(1270)^\pm K^\mp$	(	1.00	± 0.28)	$\times 10^{-3}$		1588
$K^+\overline{K}{}^*(892)^0\pi^-$ + c.c.	(	6.7	± 2.5)	$\times 10^{-4}$		1674

$\eta K^+ K^-$, no $\eta\phi$	(3.49	± 0.17)	$\times 10^{-5}$		1664
$\eta K^+ K^-$	$<$ 2.6		$\times 10^{-4}$	CL=90%	1664
$X(1750)\eta \to K^+ K^- \eta$	(4.8	± 2.8)	$\times 10^{-6}$		–
$K_1(1400)^\pm K^\mp$	$<$ 3.1		$\times 10^{-4}$	CL=90%	1532
$K_2^*(1430)^\pm K^\mp$	(7.1	$^{+1.3}_{-0.9}$)	$\times 10^{-5}$		–
$K^*(892)^0 \overline{K}^0 +$ c.c.	(1.09	± 0.20)	$\times 10^{-4}$		1697
$\omega K^+ K^-$	(1.62	± 0.11)	$\times 10^{-4}$	S=1.1	1614
$\omega K_S^0 K_S^0$	(7.0	± 0.5)	$\times 10^{-5}$		1612
$\omega K^*(892)^+ K^- +$ c.c.	(2.07	± 0.26)	$\times 10^{-4}$		1482
$\omega K_2^*(1430)^+ K^- +$ c.c.	(6.1	± 1.2)	$\times 10^{-5}$		1252
$\omega \overline{K}^*(892)^0 K^0$	(1.68	± 0.30)	$\times 10^{-4}$		1481
$\omega \overline{K}_2^*(1430)^0 K^0$	(5.8	± 2.2)	$\times 10^{-5}$		1250
$\omega X(1440) \to \omega K_S^0 K^- \pi^+ +$ c.c.	(1.6	± 0.4)	$\times 10^{-5}$		–
$\omega X(1440) \to \omega K^+ K^- \pi^0$	(1.09	± 0.26)	$\times 10^{-5}$		–
$\omega f_1(1285) \to \omega K_S^0 K^- \pi^+ +$ c.c.	(3.0	± 1.0)	$\times 10^{-6}$		–
$\omega f_1(1285) \to \omega K^+ K^- \pi^0$	(1.2	± 0.7)	$\times 10^{-6}$		–
$p\overline{p}$	(2.94	± 0.09)	$\times 10^{-4}$	S=1.3	1586
$n\overline{n}$	(3.06	± 0.15)	$\times 10^{-4}$		1586
$p\overline{p}\pi^0$	(1.53	± 0.07)	$\times 10^{-4}$		1543
$N(940)\overline{p} +$ c.c. $\to p\overline{p}\pi^0$	(6.4	$^{+1.8}_{-1.3}$)	$\times 10^{-5}$		–
$N(1440)\overline{p} +$ c.c. $\to p\overline{p}\pi^0$	(7.3	$^{+1.7}_{-1.5}$)	$\times 10^{-5}$	S=2.5	–
$N(1520)\overline{p} +$ c.c. $\to p\overline{p}\pi^0$	(6.4	$^{+2.3}_{-1.8}$)	$\times 10^{-6}$		–
$N(1535)\overline{p} +$ c.c. $\to p\overline{p}\pi^0$	(2.5	± 1.0)	$\times 10^{-5}$		–
$N(1650)\overline{p} +$ c.c. $\to p\overline{p}\pi^0$	(3.8	$^{+1.4}_{-1.7}$)	$\times 10^{-5}$		–
$N(1720)\overline{p} +$ c.c. $\to p\overline{p}\pi^0$	(1.79	$^{+0.26}_{-0.70}$)	$\times 10^{-5}$		–
$N(2300)\overline{p} +$ c.c. $\to p\overline{p}\pi^0$	(2.6	$^{+1.2}_{-0.7}$)	$\times 10^{-5}$		–
$N(2570)\overline{p} +$ c.c. $\to p\overline{p}\pi^0$	(2.13	$^{+0.40}_{-0.31}$)	$\times 10^{-5}$		–
$p\overline{p}\pi^+\pi^-$	(6.0	± 0.4)	$\times 10^{-4}$		1491
$p\overline{p}K^+K^-$	(2.7	± 0.7)	$\times 10^{-5}$		1118
$p\overline{p}\eta$	(6.0	± 0.4)	$\times 10^{-5}$		1373
$N(1535)\overline{p} +$ c.c. $\to p\overline{p}\eta$	(4.5	$^{+0.7}_{-0.6}$)	$\times 10^{-5}$		–
$p\overline{p}\pi^+\pi^-\pi^0$	(7.3	± 0.7)	$\times 10^{-4}$		1435
$p\overline{p}\rho^0$	(5.0	± 2.2)	$\times 10^{-5}$		1252
$p\overline{p}\omega$	(6.9	± 2.1)	$\times 10^{-5}$		1247
$p\overline{p}\eta'$	(1.10	± 0.13)	$\times 10^{-5}$		1141
$p\overline{p}\phi$	(6.1	± 0.6)	$\times 10^{-6}$		1109
$\phi X(1835) \to p\overline{p}\phi$	$<$ 1.82		$\times 10^{-7}$	CL=90%	–

$p\overline{n}\pi^-$ or c.c.	(2.48	±0.17)	$\times 10^{-4}$		–
$p\overline{n}\pi^-\pi^0$	(3.2	±0.7)	$\times 10^{-4}$		1492
$\Lambda\overline{\Lambda}$	(3.81	±0.13)	$\times 10^{-4}$	S=1.4	1467
$\Lambda\overline{\Lambda}\pi^0$	(1.4	±0.7)	$\times 10^{-6}$		1412
$\Lambda\overline{\Lambda}\eta$	(2.43	±0.32)	$\times 10^{-5}$		1197
$\Lambda(1670)\overline{\Lambda} \rightarrow \Lambda\overline{\Lambda}\eta$	(1.3	±0.7)	$\times 10^{-5}$		–
$\Lambda\overline{\Lambda}\eta'$	(7.3	±1.0)	$\times 10^{-6}$		892
$\Lambda\overline{\Lambda}\omega(782)$	(3.3	±0.4)	$\times 10^{-5}$		1037
$\Lambda\overline{\Lambda}\pi^+\pi^-$	(2.8	±0.6)	$\times 10^{-4}$		1346
$\Lambda\overline{p}K^+$	(1.00	±0.14)	$\times 10^{-4}$		1327
$\Lambda\overline{p}K^*(892)^+$ + c.c.	(6.3	±0.7)	$\times 10^{-5}$		1087
$\Lambda\overline{p}K^+\pi^+\pi^-$	(1.8	±0.4)	$\times 10^{-4}$		1167
$\overline{\Lambda}nK^0_S$ + c.c.	(8.1	±1.8)	$\times 10^{-5}$		1324
$\Delta^{++}\overline{\Delta}^{--}$	(1.28	±0.35)	$\times 10^{-4}$		1371
$\Lambda\overline{\Sigma}^+\pi^-$ + c.c.	(1.40	±0.13)	$\times 10^{-4}$		1376
$\Lambda\overline{\Sigma}^-\pi^+$ + c.c.	(1.54	±0.14)	$\times 10^{-4}$		1379
$\Lambda\overline{\Sigma}^0$ + c.c.	(1.6	±0.7)	$\times 10^{-6}$		1437
$\Sigma^0\overline{p}K^+$ + c.c.	(1.67	±0.18)	$\times 10^{-5}$		1291
$\Sigma^+\overline{\Sigma}^-$	(2.43	±0.10)	$\times 10^{-4}$	S=1.4	1408
$\Sigma^0\overline{\Sigma}^0$	(2.35	±0.09)	$\times 10^{-4}$	S=1.1	1405
$\Sigma^-\overline{\Sigma}^+$	(2.82	±0.09)	$\times 10^{-4}$		1401
$\Sigma^+\overline{\Sigma}^-\eta$	(9.6	±2.4)	$\times 10^{-6}$		1108
$\Sigma^+\overline{\Sigma}^-\omega$	(1.89	±0.28)	$\times 10^{-5}$		926
$\Sigma^+\overline{\Sigma}^-\phi$	(3.0	±0.7)	$\times 10^{-6}$		686
$\Sigma(1385)^+\overline{\Sigma}(1385)^-$	(8.5	±0.7)	$\times 10^{-5}$		1218
$\Sigma(1385)^-\overline{\Sigma}(1385)^+$	(8.5	±0.8)	$\times 10^{-5}$		1218
$\Sigma(1385)^0\overline{\Sigma}(1385)^0$	(6.9	±0.7)	$\times 10^{-5}$		1218
$\Xi^-\overline{\Xi}^+$	(2.87	±0.11)	$\times 10^{-4}$	S=1.1	1284
$\Xi^0\overline{\Xi}^0$	(2.3	±0.4)	$\times 10^{-4}$	S=4.2	1291
$\Xi(1530)^0\overline{\Xi}(1530)^0$	(6.8	±0.4)	$\times 10^{-5}$		1025
$\Lambda\overline{\Xi}^+K^-$ + c.c.	(3.67	±0.22)	$\times 10^{-5}$		1114
$\Xi(1690)^-\overline{\Xi}^+ \rightarrow K^-\Lambda\overline{\Xi}^+$ + c.c.	(6.2	±2.1)	$\times 10^{-6}$	S=1.5	–
$\Xi(1820)^-\overline{\Xi}^+ \rightarrow K^-\Lambda\overline{\Xi}^+$ + c.c.	(1.48	±0.29)	$\times 10^{-5}$	S=1.2	–
$\Xi(1530)^-\overline{\Xi}(1530)^+$	(1.15	±0.07)	$\times 10^{-4}$		1025
$\Xi(1530)^-\overline{\Xi}^+$	(7.0	±1.2)	$\times 10^{-6}$		1165
$\Xi(1530)^0\overline{\Xi}^0$	(5.3	±0.5)	$\times 10^{-6}$		1169
$\Sigma^0\overline{\Xi}^+K^-$ + c.c.	(3.7	±0.4)	$\times 10^{-5}$		1060
$\Omega^-K^+\overline{\Xi}^0$ + c.c.	(2.8	±0.4)	$\times 10^{-6}$		606
$\Omega^-\overline{\Omega}^+$	(5.66	±0.30)	$\times 10^{-5}$	S=1.3	774
$\eta_c\pi^+\pi^-\pi^0$	< 1.0		$\times 10^{-3}$	CL=90%	512
$h_c(1P)\pi^0$	(7.4	±0.5)	$\times 10^{-4}$		85
$\Lambda_c^+\overline{p}e^+e^-$ + c.c.	< 1.7		$\times 10^{-6}$	CL=90%	830

$\Theta(1540)\overline{\Theta}(1540) \to$ $K^0_S p K^- \overline{n}$ + c.c.	$[c] <$	8.8	$\times 10^{-6}$	CL=90%	–
$\Theta(1540) K^- \overline{n} \to K^0_S p K^- \overline{n}$	$[c] <$	1.0	$\times 10^{-5}$	CL=90%	–
$\Theta(1540) K^0_S \overline{p} \to K^0_S \overline{p} K^+ n$	$[c] <$	7.0	$\times 10^{-6}$	CL=90%	–
$\overline{\Theta}(1540) K^+ n \to K^0_S \overline{p} K^+ n$	$[c] <$	2.6	$\times 10^{-5}$	CL=90%	–
$\overline{\Theta}(1540) K^0_S p \to K^0_S p K^- \overline{n}$	$[c] <$	6.0	$\times 10^{-6}$	CL=90%	–

Radiative decays

$\gamma \chi_{c0}(1P)$	(9.75	± 0.22) %		S=1.1	261
$\gamma \chi_{c1}(1P)$	(9.75	± 0.27) %		S=1.1	171
$\gamma \chi_{c2}(1P)$	(9.38	± 0.23) %		S=1.2	128
$\gamma \eta_c(1S)$	(3.6	± 0.5)	$\times 10^{-3}$	S=1.3	635
$\gamma \eta_c(2S)$	(5.4	$^{+3.4}_{-2.9}$)	$\times 10^{-4}$		48
$\gamma 2(\pi^+\pi^-)$	(4.0	± 0.6)	$\times 10^{-4}$		1817
$\gamma 3(\pi^+\pi^-)$	$<$ 1.7		$\times 10^{-4}$	CL=90%	1774
$\gamma \eta'(958)$	(1.24	± 0.04)	$\times 10^{-4}$		1719
$\gamma f_2(1270)$	(2.73	$^{+0.29}_{-0.25}$)	$\times 10^{-4}$	S=1.8	1622
$\gamma f_0(1370) \to \gamma K \overline{K}$	(3.1	± 1.7)	$\times 10^{-5}$		1588
$\gamma f_0(1500)$	(9.3	± 1.9)	$\times 10^{-5}$		1529
$\gamma f'_2(1525)$	(3.3	± 0.8)	$\times 10^{-5}$		1531
$\gamma f_0(1710)$	seen				1436
$\gamma f_0(1710) \to \gamma \pi\pi$	(3.5	± 0.6)	$\times 10^{-5}$		–
$\gamma f_0(1710) \to \gamma K \overline{K}$	(6.6	± 0.7)	$\times 10^{-5}$		–
$\gamma f_0(2100) \to \gamma \pi\pi$	(4.8	± 1.0)	$\times 10^{-6}$		1244
$\gamma f_0(2200) \to \gamma K \overline{K}$	(3.2	± 1.0)	$\times 10^{-6}$		1193
$\gamma f_J(2220) \to \gamma \pi\pi$	$<$ 5.8		$\times 10^{-6}$	CL=90%	1168
$\gamma f_J(2220) \to \gamma K \overline{K}$	$<$ 9.5		$\times 10^{-6}$	CL=90%	1168
$\gamma \eta$	(9.2	± 1.8)	$\times 10^{-7}$		1802
$\gamma \eta \pi^+ \pi^-$	(8.7	± 2.1)	$\times 10^{-4}$		1791
$\gamma \eta(1405)$	seen				1574
$\gamma \eta(1405) \to \gamma K \overline{K} \pi$	$<$ 9		$\times 10^{-5}$	CL=90%	1569
$\gamma \eta(1405) \to \gamma \eta \pi^+ \pi^-$	(3.6	± 2.5)	$\times 10^{-5}$		–
$\gamma \eta(1405) \to \gamma f_0(980)\pi^0 \to \gamma \pi^+ \pi^- \pi^0$	$<$ 5.0		$\times 10^{-7}$	CL=90%	–
$\gamma \eta(1475)$	seen				1548
$\gamma \eta(1475) \to \gamma K \overline{K} \pi$	$<$ 1.4		$\times 10^{-4}$	CL=90%	–
$\gamma \eta(1475) \to \gamma \eta \pi^+ \pi^-$	$<$ 8.8		$\times 10^{-5}$	CL=90%	–
$\gamma K^{*0} K^+ \pi^-$ + c.c.	(3.7	± 0.9)	$\times 10^{-4}$		1674
$\gamma K^{*0} \overline{K}^{*0}$	(2.4	± 0.7)	$\times 10^{-4}$		1613
$\gamma K^0_S K^+ \pi^-$ + c.c.	(2.6	± 0.5)	$\times 10^{-4}$		1753
$\gamma K^+ K^- \pi^+ \pi^-$	(1.9	± 0.5)	$\times 10^{-4}$		1726
$\gamma K^+ K^- 2(\pi^+\pi^-)$	$<$ 2.2		$\times 10^{-4}$	CL=90%	1654
$\gamma 2(K^+ K^-)$	$<$ 4		$\times 10^{-5}$	CL=90%	1499

$\gamma p\overline{p}$	(3.9 $\pm$0.5) $\times 10^{-5}$			S=2.0	1586
$\gamma f_2(1950) \rightarrow \gamma p\overline{p}$	(1.20 $\pm$0.22) $\times 10^{-5}$				–
$\gamma f_2(2150) \rightarrow \gamma p\overline{p}$	(7.2 $\pm$1.8) $\times 10^{-6}$				–
$\gamma X(1835) \rightarrow \gamma p\overline{p}$	(4.6 $^{+1.8}_{-4.0}$) $\times 10^{-6}$				–
$\gamma X \rightarrow \gamma p\overline{p}$	[h] < 2		$\times 10^{-6}$	CL=90%	–
$\gamma p\overline{p}\pi^+\pi^-$	(2.8 $\pm$1.4) $\times 10^{-5}$				1491
$\gamma\gamma$	< 1.5		$\times 10^{-4}$	CL=90%	1843
$\gamma\gamma J/\psi$	(3.1 $^{+1.0}_{-1.2}$) $\times 10^{-4}$				542
$e^+e^-\eta'$	(1.90 $\pm$0.26) $\times 10^{-6}$				1719
$e^+e^-\eta_c(1S)$	(3.8 $\pm$0.4) $\times 10^{-5}$				635
$e^+e^-\chi_{c0}(1P)$	(1.05 $\pm$0.25) $\times 10^{-3}$				261
$e^+e^-\chi_{c1}(1P)$	(8.5 $\pm$0.7) $\times 10^{-4}$				171
$e^+e^-\chi_{c2}(1P)$	(6.8 $\pm$0.8) $\times 10^{-4}$				128
Weak decays					
$D^0e^+e^-$ + c.c.	< 1.4		$\times 10^{-7}$	CL=90%	1371
$\Lambda_c^+\overline{\Sigma}^-$ + c.c.	< 1.4		$\times 10^{-5}$	CL=90%	586
Other decays					
invisible	< 1.6		%	CL=90%	–

$\psi(3770)$

$I^G(J^{PC}) = 0^-(1^{--})$

Mass $m = 3773.7 \pm 0.7$ MeV (S = 2.3)
Full width $\Gamma = 27.2 \pm 1.0$ MeV

$\psi(3770)$ DECAY MODES	Fraction (Γ_i/Γ)		Scale factor/ Confidence level	p (MeV/c)
$D\overline{D}$	(93 $^{+8}_{-9}$) %		S=2.0	287
$D^0\overline{D}^0$	(52 $^{+4}_{-5}$) %		S=2.0	287
D^+D^-	(41 $\pm$4) %		S=2.0	254
$J/\psi X$	(5.0 $\pm$2.2) $\times 10^{-3}$			–
$J/\psi\pi^+\pi^-$	(1.93$\pm$0.28) $\times 10^{-3}$			561
$J/\psi\pi^0\pi^0$	(8.0 $\pm$3.0) $\times 10^{-4}$			565
$J/\psi\eta$	(8.7 $\pm$1.2) $\times 10^{-4}$			361
$J/\psi\pi^0$	< 2.8	$\times 10^{-4}$	CL=90%	604
e^+e^-	(9.6 $\pm$0.7) $\times 10^{-6}$		S=1.3	1887
Decays to light hadrons				
$b_1(1235)\pi$	< 1.4	$\times 10^{-5}$	CL=90%	1684
$\phi\eta'$	< 2.3	$\times 10^{-5}$	CL=90%	1607
$\omega\eta'$	< 4	$\times 10^{-4}$	CL=90%	1672
$\rho^0\eta'$	< 6	$\times 10^{-4}$	CL=90%	1674

$\phi\eta$	(3.1	± 0.7)	$\times 10^{-4}$		1703
$\omega\eta$	$<$ 1.4		$\times 10^{-5}$	CL=90%	1762
$\rho^0\eta$	$<$ 5		$\times 10^{-4}$	CL=90%	1764
$\phi\pi^0$	$<$ 3		$\times 10^{-5}$	CL=90%	1746
$\omega\pi^0$	$<$ 6		$\times 10^{-4}$	CL=90%	1803
$\pi^+\pi^-\pi^0$	$<$ 5		$\times 10^{-6}$	CL=90%	1874
$\rho\pi$	$<$ 5		$\times 10^{-6}$	CL=90%	1805
K^+K^-	not seen				1821
$K^*(892)^+K^-$ + c.c.	$<$ 1.4		$\times 10^{-5}$	CL=90%	1745
$K^*(892)^0\overline{K}^0$ + c.c.	$<$ 1.2		$\times 10^{-3}$	CL=90%	1745
$K^0_S K^0_L$	(2.6	$^{+1.4}_{-1.6}$)	$\times 10^{-5}$		1820
$2(\pi^+\pi^-)$	$<$ 1.12		$\times 10^{-3}$	CL=90%	1861
$2(\pi^+\pi^-)\pi^0$	$<$ 1.06		$\times 10^{-3}$	CL=90%	1844
$2(\pi^+\pi^-\pi^0)$	$<$ 5.85		%	CL=90%	1821
$\omega\pi^+\pi^-$	$<$ 6.0		$\times 10^{-4}$	CL=90%	1794
$3(\pi^+\pi^-)$	$<$ 9.1		$\times 10^{-3}$	CL=90%	1820
$3(\pi^+\pi^-)\pi^0$	$<$ 1.37		%	CL=90%	1792
$3(\pi^+\pi^-)2\pi^0$	$<$ 11.74		%	CL=90%	1760
$\eta\pi^+\pi^-$	$<$ 1.24		$\times 10^{-3}$	CL=90%	1836
$\pi^+\pi^-2\pi^0$	$<$ 8.9		$\times 10^{-3}$	CL=90%	1862
$\rho^0\pi^+\pi^-$	$<$ 6.9		$\times 10^{-3}$	CL=90%	1796
$\eta 3\pi$	$<$ 1.34		$\times 10^{-3}$	CL=90%	1824
$\eta 2(\pi^+\pi^-)$	$<$ 2.43		%	CL=90%	1804
$\eta\rho^0\pi^+\pi^-$	$<$ 1.45		%	CL=90%	1708
$\eta' 3\pi$	$<$ 2.44		$\times 10^{-3}$	CL=90%	1741
$K^+K^-\pi^+\pi^-$	$<$ 9.0		$\times 10^{-4}$	CL=90%	1773
$\phi\pi^+\pi^-$	$<$ 4.1		$\times 10^{-4}$	CL=90%	1737
$K^+K^-2\pi^0$	$<$ 4.2		$\times 10^{-3}$	CL=90%	1774
$4(\pi^+\pi^-)$	$<$ 1.67		%	CL=90%	1757
$4(\pi^+\pi^-)\pi^0$	$<$ 3.06		%	CL=90%	1720
$\phi f_0(980)$	$<$ 4.5		$\times 10^{-4}$	CL=90%	1597
$K^+K^-\pi^+\pi^-\pi^0$	$<$ 2.36		$\times 10^{-3}$	CL=90%	1741
$K^+K^-\rho^0\pi^0$	$<$ 8		$\times 10^{-4}$	CL=90%	1624
$K^+K^-\rho^+\pi^-$	$<$ 1.46		%	CL=90%	1623
ωK^+K^-	$<$ 3.4		$\times 10^{-4}$	CL=90%	1664
$\phi\pi^+\pi^-\pi^0$	$<$ 3.8		$\times 10^{-3}$	CL=90%	1723
$K^{*0}K^-\pi^+\pi^0$ + c.c.	$<$ 1.62		%	CL=90%	1694
$K^{*+}K^-\pi^+\pi^-$ + c.c.	$<$ 3.23		%	CL=90%	1693
$K^+K^-\pi^+\pi^-2\pi^0$	$<$ 2.67		%	CL=90%	1705
$K^+K^-2(\pi^+\pi^-)$	$<$ 1.03		%	CL=90%	1702
$K^+K^-2(\pi^+\pi^-)\pi^0$	$<$ 3.60		%	CL=90%	1661
ηK^+K^-	$<$ 4.1		$\times 10^{-4}$	CL=90%	1712
$\eta K^+K^-\pi^+\pi^-$	$<$ 1.24		%	CL=90%	1624
$\rho^0 K^+K^-$	$<$ 5.0		$\times 10^{-3}$	CL=90%	1666

$2(K^+K^-)$	$<$	6.0	$\times 10^{-4}$	CL=90%	1552
ϕK^+K^-	$<$	7.5	$\times 10^{-4}$	CL=90%	1598
$2(K^+K^-)\pi^0$	$<$	2.9	$\times 10^{-4}$	CL=90%	1494
$2(K^+K^-)\pi^+\pi^-$	$<$	3.2	$\times 10^{-3}$	CL=90%	1426
$K^0_S K^-\pi^+$	$<$	3.2	$\times 10^{-3}$	CL=90%	1799
$K^0_S K^-\pi^+\pi^0$	$<$	1.33	%	CL=90%	1773
$K^0_S K^-\rho^+$	$<$	6.6	$\times 10^{-3}$	CL=90%	1665
$K^0_S K^-2\pi^+\pi^-$	$<$	8.7	$\times 10^{-3}$	CL=90%	1740
$K^0_S K^-\pi^+\rho^0$	$<$	1.6	%	CL=90%	1621
$K^0_S K^-\pi^+\eta$	$<$	1.3	%	CL=90%	1670
$K^0_S K^-2\pi^+\pi^-\pi^0$	$<$	4.18	%	CL=90%	1703
$K^0_S K^-2\pi^+\pi^-\eta$	$<$	4.8	%	CL=90%	1570
$K^0_S K^-\pi^+2(\pi^+\pi^-)$	$<$	1.22	%	CL=90%	1658
$K^0_S K^-\pi^+2\pi^0$	$<$	2.65	%	CL=90%	1742
$K^0_S K^-K^+K^-\pi^+$	$<$	4.9	$\times 10^{-3}$	CL=90%	1491
$K^0_S K^-K^+K^-\pi^+\pi^0$	$<$	3.0	%	CL=90%	1427
$K^0_S K^-K^+K^-\pi^+\eta$	$<$	2.2	%	CL=90%	1214
$K^{*0}K^-\pi^+ +$ c.c.	$<$	9.7	$\times 10^{-3}$	CL=90%	1722
$p\overline{p}$	not seen				1637
$p\overline{p}\pi^0$	$<$	4	$\times 10^{-5}$	CL=90%	1595
$p\overline{p}\pi^+\pi^-$	$<$	5.8	$\times 10^{-4}$	CL=90%	1544
$\Lambda\overline{\Lambda}$	$<$	1.2	$\times 10^{-4}$	CL=90%	1522
$p\overline{p}\pi^+\pi^-\pi^0$	$<$	1.85	$\times 10^{-3}$	CL=90%	1490
$\omega p\overline{p}$	$<$	2.9	$\times 10^{-4}$	CL=90%	1310
$\Lambda\overline{\Lambda}\pi^0$	$<$	7	$\times 10^{-5}$	CL=90%	1469
$p\overline{p}2(\pi^+\pi^-)$	$<$	2.6	$\times 10^{-3}$	CL=90%	1426
$\eta p\overline{p}$	$<$	5.4	$\times 10^{-4}$	CL=90%	1431
$\eta p\overline{p}\pi^+\pi^-$	$<$	3.3	$\times 10^{-3}$	CL=90%	1284
$\rho^0 p\overline{p}$	$<$	1.7	$\times 10^{-3}$	CL=90%	1314
$p\overline{p}K^+K^-$	$<$	3.2	$\times 10^{-4}$	CL=90%	1186
$\eta p\overline{p}K^+K^-$	$<$	6.9	$\times 10^{-3}$	CL=90%	737
$\pi^0 p\overline{p}K^+K^-$	$<$	1.2	$\times 10^{-3}$	CL=90%	1094
$\phi p\overline{p}$	$<$	1.3	$\times 10^{-4}$	CL=90%	1178
$\Lambda\overline{\Lambda}\pi^+\pi^-$	$<$	2.5	$\times 10^{-4}$	CL=90%	1405
$\Lambda\overline{p}K^+$	$<$	2.8	$\times 10^{-4}$	CL=90%	1387
$\Lambda\overline{p}K^+\pi^+\pi^-$	$<$	6.3	$\times 10^{-4}$	CL=90%	1234
$\Lambda\overline{\Lambda}\eta$	$<$	1.9	$\times 10^{-4}$	CL=90%	1263
$\Sigma^+\overline{\Sigma}^-$	$<$	1.0	$\times 10^{-4}$	CL=90%	1465
$\Sigma^0\overline{\Sigma}^0$	$<$	4	$\times 10^{-5}$	CL=90%	1462
$\Xi^0\overline{\Xi}^0$	$<$	3.4	$\times 10^{-4}$	CL=90%	1353
$\Xi^-\overline{\Xi}^+$	(1.4	± 0.4)	$\times 10^{-4}$		1347
$\Lambda\overline{\Xi}^+K^- +$ c.c.	$<$	1.0	$\times 10^{-4}$	CL=90%	1185
$\Sigma^0\overline{\Xi}^+K^- +$ c.c.	$<$	3.4	$\times 10^{-4}$	CL=90%	1134

Radiative decays

$\gamma\chi_{c2}$	$<$ 6.4	$\times 10^{-4}$	CL=90%	211
$\gamma\chi_{c1}$	(2.49±0.23)	$\times 10^{-3}$		254
$\gamma\chi_{c0}$	(6.9 ±0.6)	$\times 10^{-3}$		342
$\gamma\eta_c$	$<$ 7	$\times 10^{-4}$	CL=90%	707
$\gamma\eta_c(2S)$	$<$ 9	$\times 10^{-4}$	CL=90%	133
$\gamma\eta'$	$<$ 1.8	$\times 10^{-4}$	CL=90%	1765
$\gamma\eta$	$<$ 1.5	$\times 10^{-4}$	CL=90%	1847
$\gamma\pi^0$	$<$ 2	$\times 10^{-4}$	CL=90%	1884

$\psi_2(3823)$

$I^G(J^{PC}) = 0^-(2^{--})$
I, J, P need confirmation.

was $\psi(3823)$, $X(3823)$

Mass $m = 3823.51 \pm 0.34$ MeV
Full width $\Gamma < 2.9$ MeV, CL = 90%

Branching fractions are given relative to the one **DEFINED AS 1**.

$\psi_2(3823)$ DECAY MODES	Fraction (Γ_i/Γ)	Confidence level	p (MeV/c)
$J/\psi(1S)\pi^+\pi^-$	<0.06	90%	607
$J/\psi(1S)\pi^0\pi^0$	<0.11	90%	610
$J/\psi(1S)\pi^0$	<0.030	90%	646
$J/\psi(1S)\eta$	<0.14	90%	431
$\chi_{c0}\gamma$	<0.24	90%	387
$\chi_{c1}\gamma$	**DEFINED AS 1**		300
$\chi_{c2}\gamma$	$0.28\ ^{+0.14}_{-0.11}$		258

$\psi_3(3842)$

$I^G(J^{PC}) = 0^-(3^{--})$
J, P need confirmation.

Mass $m = 3842.71 \pm 0.20$ MeV
Full width $\Gamma = 2.8 \pm 0.6$ MeV

$\psi_3(3842)$ DECAY MODES	Fraction (Γ_i/Γ)	p (MeV/c)
D^+D^-	seen	443
$D^0\overline{D}^0$	seen	463

$\chi_{c1}(3872)$

$I^G(J^{PC}) = 0^+(1^{++})$

also known as $X(3872)$

Mass $m = 3871.64 \pm 0.06$ MeV
$m_{\chi_{c1}(3872)} - m_{J/\psi} = 775 \pm 4$ MeV
Full width $\Gamma = 1.19 \pm 0.21$ MeV (S = 1.1)

$\chi_{c1}(3872)$ DECAY MODES	Fraction (Γ_i/Γ)	Confidence level	p (MeV/c)
e^+e^-	$< 2.7 \times 10^{-7}$	90%	1936
$\pi^+\pi^-\pi^0$	< 1.0 %	90%	1924
$\pi^+\pi^- J/\psi(1S)$	(4.3± 1.4) %		650
$\pi^+\pi^-\pi^0 J/\psi(1S)$	not seen		588
$\omega\eta_c(1S)$	< 40 %	90%	368
$\rho(770)^0 J/\psi(1S)$	(3.4± 1.1) %		–
$\omega J/\psi(1S)$	(5.0± 1.9) %		†
$\phi\phi$	not seen		1646
$D^0\overline{D}{}^0\pi^0$	(55 ±28) %		116
$\overline{D}{}^{*0}D^0$	(46 ±16) %		†
$\gamma\gamma$	< 13 %	90%	1936
$D^0\overline{D}{}^0$	< 32 %	90%	519
D^+D^-	< 22 %	90%	502
$\pi^0\chi_{c2}$	< 5 %	90%	273
$\pi^0\chi_{c1}$	($3.8^{+\ 1.9}_{-\ 1.7}$) %		319
$\pi^0\chi_{c0}$	< 16 %	90%	411
$\pi^+\pi^-\eta_c(1S)$	< 16 %	90%	745
$\pi^0\pi^0\chi_{c0}$	< 7 %	90%	347
$\pi^0\pi^0\chi_{c1}$	< 5 %	90%	228
$\pi^0\pi^0\chi_{c2}$	< 2.2 %	90%	156
$\pi^+\pi^-\chi_{c0}$	< 2.4 %	90%	340
$\pi^+\pi^-\chi_{c1}$	$< 8 \times 10^{-3}$	90%	218
$p\overline{p}$	$< 2.7 \times 10^{-5}$	95%	1693
$\pi^+\pi^-\eta$	$< 5 \times 10^{-3}$	90%	1887
Radiative decays			
γD^+D^-	< 4 %	90%	502
$\gamma\overline{D}{}^0D^0$	< 7 %	90%	519
$\gamma J/\psi$	(10 ± 4) $\times 10^{-3}$		697
$\gamma\chi_{c1}$	< 1.0 %	90%	344
$\gamma\chi_{c2}$	< 4 %	90%	303
$\gamma\psi(2S)$	possibly seen		181
$\gamma\psi_2(3823)$	$< 3.3 \times 10^{-3}$	90%	48

C-violating decays

$\eta J/\psi$	$<$ 2.1	%	90%	491

$\chi_{c0}(3915)$

$I^G(J^{PC}) = 0^+(0^{++})$

was $X(3915)$

Mass $m = 3922.1 \pm 1.8$ MeV (S = 1.5)
Full width $\Gamma = 20 \pm 4$ MeV (S = 1.1)

$\chi_{c0}(3915)$ DECAY MODES	Fraction (Γ_i/Γ)	p (MeV/c)
$\omega J/\psi$	seen	232
$\overline{D}^{*0} D^0$	not seen	313
$D^+ D^-$	seen	592
$D_s^+ D_s^-$	seen	†
$\pi^+\pi^-\eta_c(1S)$	not seen	788
$\eta_c\eta$	not seen	668
$\eta_c\pi^0$	not seen	817
$K\overline{K}$	not seen	1898
$\gamma\gamma$	seen	1961
$\gamma\psi(2S)$	not seen	229
$\pi^0\chi_{c1}$	not seen	368

$\chi_{c2}(3930)$

$I^G(J^{PC}) = 0^+(2^{++})$

Mass $m = 3922.5 \pm 1.0$ MeV (S = 1.7)
Full width $\Gamma = 35.2 \pm 2.2$ MeV (S = 1.2)

$\chi_{c2}(3930)$ DECAY MODES	Fraction (Γ_i/Γ)	p (MeV/c)
$\gamma\gamma$	seen	1961
$K\overline{K}\pi$	not seen	1878
$K^+K^-\pi^+\pi^-\pi^0$	not seen	1822
$D\overline{D}$	seen	607
D^+D^-	seen	592
$D^0\overline{D}^0$	seen	607
$\pi^+\pi^-\eta_c(1S)$	not seen	788
$K\overline{K}$	not seen	1898

$\psi(4040)$ [i]

$I^G(J^{PC}) = 0^-(1^{--})$

Mass $m = 4040 \pm 4$ MeV
Full width $\Gamma = 84 \pm 12$ MeV

Due to the complexity of the $c\overline{c}$ threshold region, in this listing, "seen" ("not seen") means that a cross section for the mode in question has been measured at effective $\sqrt{s}$ near this particle's central mass value, more (less) than 2σ above zero, without regard to any peaking behavior in $\sqrt{s}$ or absence thereof. See mode listing(s) for details and references.

$\psi(4040)$ DECAY MODES	Fraction (Γ_i/Γ)	Confidence level	p (MeV/c)
$e^+ e^-$	$(1.02\pm0.17)\times10^{-5}$		2020
$D\overline{D}$	seen		776
$D^0\overline{D}^0$	seen		776
D^+D^-	seen		764
$D^*\overline{D}+$ c.c.	seen		570
$D^*(2007)^0\overline{D}^0+$ c.c.	seen		576
$D^*(2010)^+D^-+$ c.c.	seen		562
$D^*\overline{D}^*$	seen		196
$D^*(2007)^0\overline{D}^*(2007)^0$	seen		228
$D^*(2010)^+D^*(2010)^-$	seen		196
$D\overline{D}\pi$ (excl. $D^*\overline{D}$)	not seen		–
$D^0D^-\pi^+$+c.c. (excl. $D^*(2010)^+D^-$ +c.c.)	not seen		–
$D\overline{D}^*\pi$ (excl. $D^*\overline{D}^*$)	not seen		–
$D^0\overline{D}^{*-}\pi^+$+c.c. (excl. $D^*(2010)^+D^*(2010)^-$)	seen		–
$D_s^+D_s^-$	seen		453
$\pi^+\pi^+\pi^-\pi^-\pi^0$	seen		1979
$J/\psi(1S)$ hadrons	seen		–
$J/\psi\pi^+\pi^-$	$<4\times10^{-3}$	90%	795
$J/\psi\pi^0\pi^0$	$<2\times10^{-3}$	90%	797
$J/\psi\eta$	$(5.2\ \pm0.7\ )\times10^{-3}$		676
$J/\psi\pi^0$	$<2.8\times10^{-4}$	90%	824
$J/\psi\pi^+\pi^-\pi^0$	$<2\times10^{-3}$	90%	747
$\chi_{c1}\gamma$	$<3.4\times10^{-3}$	90%	494
$\chi_{c2}\gamma$	$<5\times10^{-3}$	90%	455
$\chi_{c1}\pi^+\pi^-\pi^0$	<1.1 %	90%	307
$\chi_{c2}\pi^+\pi^-\pi^0$	<3.2 %	90%	234
$h_c(1P)\pi^+\pi^-$	$<3\times10^{-3}$	90%	404
$\phi\pi^+\pi^-$	$<3\times10^{-3}$	90%	1880
$\Lambda\overline{\Lambda}\pi^+\pi^-$	$<2.9\times10^{-4}$	90%	1579
$\Lambda\overline{\Lambda}\pi^0$	$<9\times10^{-5}$	90%	1636
$\Lambda\overline{\Lambda}\eta$	$<3.0\times10^{-4}$	90%	1452
$\Lambda\overline{\Lambda}$	$<6\times10^{-6}$	90%	1684
$\Sigma^+\overline{\Sigma}^-$	$<1.3\times10^{-4}$	90%	1632
$\Sigma^0\overline{\Sigma}^0$	$<7\times10^{-5}$	90%	1630
$\Xi^+\overline{\Xi}^-$	$<1.6\times10^{-4}$	90%	1527

$\Xi^0\overline{\Xi}^0$	< 1.8	$\times 10^{-4}$	90%	1533
$\Xi^-\overline{\Xi}^+$	< 6	$\times 10^{-5}$	90%	1527
$\Lambda\overline{\Xi}^+K^-$ + c.c.	< 7	$\times 10^{-5}$	90%	1386
$\Sigma^0\overline{\Xi}^+K^-$ + c.c.	< 1.5	$\times 10^{-5}$	90%	1343
$\mu^+\mu^-$	(9 ± 6)	$\times 10^{-6}$		2017

$\chi_{c1}(4140)$

$I^G(J^{PC}) = 0^+(1^{++})$

was $X(4140)$

Mass $m = 4146.5 \pm 3.0$ MeV (S = 1.3)
Full width $\Gamma = 19^{+7}_{-5}$ MeV

$\chi_{c1}(4140)$ DECAY MODES	Fraction (Γ_i/Γ)	p (MeV/c)
$J/\psi\phi$	seen	216
$\gamma\gamma$	not seen	2073

$\psi(4160)$ [i]

$I^G(J^{PC}) = 0^-(1^{--})$

Mass $m = 4191 \pm 5$ MeV
Full width $\Gamma = 69 \pm 10$ MeV

Due to the complexity of the $c\overline{c}$ threshold region, in this listing, "seen" ("not seen") means that a cross section for the mode in question has been measured at effective $\sqrt{s}$ near this particle's central mass value, more (less) than 2σ above zero, without regard to any peaking behavior in $\sqrt{s}$ or absence thereof. See mode listing(s) for details and references.

$\psi(4160)$ DECAY MODES	Fraction (Γ_i/Γ)	Confidence level	p (MeV/c)
e^+e^-	$(6.9 \pm 3.3) \times 10^{-6}$		2096
$\mu^+\mu^-$	seen		2093
$D\overline{D}$	seen		956
$D^0\overline{D}^0$	seen		956
D^+D^-	seen		947
$D^*\overline{D}$ + c.c.	seen		798
$D^*(2007)^0\overline{D}^0$ + c.c.	seen		802
$D^*(2010)^+D^-$ + c.c.	seen		792
$D^*\overline{D}^*$	seen		592
$D^*(2007)^0\overline{D}^*(2007)^0$	seen		604
$D^*(2010)^+D^*(2010)^-$	seen		592
$D^0D^-\pi^+$ +c.c. (excl. $D^*(2010)^+D^-$ +c.c.)	not seen		–
$D\overline{D}^*\pi$ +c.c. (excl. $D^*\overline{D}^*$)	seen		–

$D^0 D^{*-}\pi^+$ +c.c. (excl. $D^*(2010)^+ D^*(2010)^-$)	not seen			–
$D_s^+ D_s^-$	not seen			719
$D_s^{*+} D_s^-$ +c.c.	seen			478
$J/\psi\pi^+\pi^-$	< 3	$\times 10^{-3}$	90%	919
$J/\psi\pi^0\pi^0$	< 3	$\times 10^{-3}$	90%	921
$J/\psi K^+ K^-$	< 2	$\times 10^{-3}$	90%	407
$J/\psi\eta$	< 8	$\times 10^{-3}$	90%	821
$J/\psi\pi^0$	< 1	$\times 10^{-3}$	90%	944
$J/\psi\eta'$	< 5	$\times 10^{-3}$	90%	456
$J/\psi\pi^+\pi^-\pi^0$	< 1	$\times 10^{-3}$	90%	879
$\psi(2S)\pi^+\pi^-$	< 4	$\times 10^{-3}$	90%	395
$\chi_{c1}\gamma$	< 5	$\times 10^{-3}$	90%	625
$\chi_{c2}\gamma$	< 1.3	%	90%	587
$\chi_{c1}\pi^+\pi^-\pi^0$	< 2	$\times 10^{-3}$	90%	496
$\chi_{c2}\pi^+\pi^-\pi^0$	< 8	$\times 10^{-3}$	90%	444
$h_c(1P)\pi^+\pi^-$	< 5	$\times 10^{-3}$	90%	556
$h_c(1P)\pi^0\pi^0$	< 2	$\times 10^{-3}$	90%	560
$h_c(1P)\eta$	< 2	$\times 10^{-3}$	90%	348
$h_c(1P)\pi^0$	< 4	$\times 10^{-4}$	90%	600
$\omega\pi^+\pi^-$	seen			2013
$\phi\pi^+\pi^-$	< 2	$\times 10^{-3}$	90%	1961
$\gamma\chi_{c1}(3872)$	< 1.6	$\times 10^{-3}$	90%	307
$\gamma\chi_{c0}(3915) \to \gamma J/\psi\pi^+\pi^-$	< 1.36	$\times 10^{-4}$	90%	–
$\gamma X(3930) \to \gamma J/\psi\pi^+\pi^-$	< 1.18	$\times 10^{-4}$	90%	–
$\gamma X(3940) \to \gamma J/\psi\pi^+\pi^-$	< 1.47	$\times 10^{-4}$	90%	–
$\gamma\chi_{c0}(3915) \to \gamma\gamma J/\psi$	< 1.26	$\times 10^{-4}$	90%	–
$\gamma X(3930) \to \gamma\gamma J/\psi$	< 8.8	$\times 10^{-5}$	90%	–
$\gamma X(3940) \to \gamma\gamma J/\psi$	< 1.79	$\times 10^{-4}$	90%	–
$\omega\pi^0$	not seen			2020
$\omega\eta$	not seen			1984
$K^+ K^-$	not seen			2037
$K_S^0 K^\pm\pi^\mp$	seen			2017
$p\overline{p}p\overline{p}$	not seen			834
$\Lambda\overline{\Lambda}$	< 1.5	$\times 10^{-6}$	90%	1774
$\Sigma^+\overline{\Sigma}^-$	< 2.0	$\times 10^{-4}$	90%	1725
$\Xi^0\overline{\Xi}^0$	< 1.4	$\times 10^{-4}$	90%	1632
$\Xi^-\overline{\Xi}^+$	< 8	$\times 10^{-5}$	90%	1626
$pK^-\overline{\Lambda}$ + c.c.	< 6	$\times 10^{-6}$	90%	1659
$\Lambda\overline{\Xi}^+ K^-$ + c.c.	seen			1494
$\Sigma^0\overline{\Xi}^+ K^-$ + c.c.	< 3.1	$\times 10^{-6}$	90%	1454

$\psi(4230)$

$I^G(J^{PC}) = 0^-(1^{--})$

also known as $Y(4230)$; was $\psi(4260)$

Mass $m = 4222.2 \pm 2.4$ MeV (S = 1.7)
Full width $\Gamma = 51 \pm 8$ MeV (S = 3.7)

$\psi(4230)$ DECAY MODES	Fraction (Γ_i/Γ)	p (MeV/c)
$\mu^+\mu^-$	$(3.0\pm2.7)\times10^{-5}$	2107
$\eta_c(1S)\pi^+\pi^-$	not seen	1027
$\eta_c(1S)\pi^+\pi^-\pi^0$	seen	992
$J/\psi\pi^+\pi^-$	seen	942
$J/\psi f_0(980)$, $f_0(980)\to\ \pi^+\pi^-$	seen	–
$T_{c\overline{c}1}(3900)^\pm\pi^\mp$, $T^\pm_{c\overline{c}1}\to$ $J/\psi\pi^\pm$	seen	–
$J/\psi\pi^0\pi^0$	seen	944
$J/\psi K^+K^-$	seen	460
$J/\psi K^0_S K^0_S$	not seen	447
$J/\psi\eta$	seen	848
$J/\psi\pi^0$	not seen	966
$J/\psi\eta'$	seen	504
$J/\psi\pi^+\pi^-\pi^0$	not seen	904
$J/\psi\eta\pi^0$	not seen	770
$J/\psi\eta\eta$	not seen	211
$\psi(2S)\pi^+\pi^-$	seen	426
$\psi(2S)\eta$	not seen	†
$\chi_{c0}\omega$	seen	171
$\chi_{c1}\pi^+\pi^-\pi^0$	not seen	527
$\chi_{c2}\pi^+\pi^-\pi^0$	not seen	477
$h_c(1P)\pi^+\pi^-$	seen	583
$\phi\pi^+\pi^-$	not seen	1976
$\phi f_0(980)\to\ \phi\pi^+\pi^-$	not seen	–
ϕK^+K^-	not seen	1856
$\phi K^0_S K^0_S$	not seen	1854
$\phi\eta$	not seen	1947
$\phi\eta'$	not seen	1864
$D\overline{D}$	not seen	987
$D^0\overline{D}^0$	possibly seen	987
D^+D^-	possibly seen	978
$D^*\overline{D}$+c.c.	not seen	835
$D^*(2007)^0\overline{D}^0$+c.c.	not seen	839
$D^*(2010)^+D^-$+c.c.	not seen	829
$D^*\overline{D}^*$	not seen	641

$D^*(2007)^0\overline{D}^*(2007)^0$	not seen	652
$D^*(2010)^+D^*(2010)^-$	not seen	641
$D\overline{D}\pi$ +c.c.	not seen	847
$D^0D^-\pi^+$ +c.c. (excl. $D^*(2007)^0\overline{D}^{*0}$ +c.c., $D^*(2010)^+D^-$ +c.c.)	not seen	–
$D\overline{D}^*\pi$ +c.c. (excl. $D^*\overline{D}^*$)	not seen	723
$D^0D^*(2010)^-\pi^+$ +c.c.	seen	650
$D_1(2420)\overline{D}$ + c.c.	not seen	†
$D^*\overline{D}^*\pi$	seen	367
$D^{*0}D^{*-}\pi^+$	seen	364
$D_s^+D_s^-$	not seen	760
$D_s^{*+}D_s^-$ +c.c.	not seen	538
$D_s^{*+}D_s^{*-}$	not seen	†
$p\overline{p}$	not seen	1890
$p\overline{p}\pi^0$	not seen	1854
$p\overline{p}\eta$	not seen	1712
$\omega\pi^+\pi^-$	seen	2028
$p\overline{p}\omega$	not seen	1610
$\Xi^-\overline{\Xi}^+$	not seen	1645
$\pi^+\pi^+\pi^-\pi^-$	not seen	2087
$\pi^+\pi^+\pi^-\pi^-\pi^0$	not seen	2071
$\omega\pi^0$	not seen	2035
$\omega\eta$	not seen	1999
$K_S^0K^\pm\pi^\mp$	not seen	2032
$K_S^0K^\pm\pi^\mp\pi^0$	not seen	2009
$K_S^0K^\pm\pi^\mp\eta$	not seen	1917
$K^+K^-\pi^0$	not seen	2033
$K^+K^-\pi^+\pi^-$	not seen	2008
$K^+K^-\pi^+\pi^-\pi^0$	not seen	1981
$K^+K^+K^-K^-$	not seen	1813
$K^+K^+K^-K^-\pi^0$	not seen	1762
$p\overline{p}\pi^+\pi^-$	not seen	1810
$p\overline{p}\pi^+\pi^-\pi^0$	not seen	1764
$p\overline{p}p\overline{p}$	not seen	864
$\Lambda\overline{\Lambda}$	not seen	1791
$\Sigma^+\overline{\Sigma}^-$	not seen	1743
$pK^-\overline{\Lambda}$ + c.c.	not seen	1677
$\Lambda\overline{\Xi}^+K^-$ + c.c.	not seen	1514
$\Sigma^0\overline{\Xi}^+K^-$ + c.c.	not seen	1474

Radiative decays

$\eta_c(1S)\gamma$	possibly seen	1055
$\eta_c(1S)\pi^0\gamma$	not seen	1048

$\chi_{c1}\gamma$	not seen	650
$\chi_{c2}\gamma$	not seen	612
$\chi_{c1}(3872)\gamma$	seen	334

$\chi_{c1}(4274)$

$I^G(J^{PC}) = 0^+(1^{++})$

was $X(4274)$

Mass $m = 4286^{+8}_{-9}$ MeV (S = 1.7)
Full width $\Gamma = 51 \pm 7$ MeV

$\chi_{c1}(4274)$ DECAY MODES	Fraction (Γ_i/Γ)	p (MeV/c)
$J/\psi\phi$	seen	522

$\psi(4360)$

$I^G(J^{PC}) = 0^-(1^{--})$

also known as $Y(4360)$; was $X(4360)$

Mass $m = 4374 \pm 7$ MeV (S = 2.4)
Full width $\Gamma = 120 \pm 12$ MeV (S = 2.1)

$\psi(4360)$ DECAY MODES	Fraction (Γ_i/Γ)	p (MeV/c)
e^+e^-	seen	2187
$h_c\pi^+\pi^-$	seen	723
$J/\psi\pi^+\pi^-$	seen	1063
$\psi(2S)\pi^+\pi^-$	seen	579
$\psi(3770)\pi^+\pi^-$	possibly seen	495
$\psi_2(3823)\pi^+\pi^-$	seen	444
$J/\psi\eta$	seen	982
$D^0D^{*-}\pi^+$	not seen	868
$D^+D^-\pi^+\pi^-$	seen	862
$D_1(2420)\overline{D}+$ c.c.	possibly seen	431
$\phi\eta$	not seen	2030
$\omega\pi^0$	not seen	2115
$\omega\eta$	not seen	2080
$p\overline{p}\eta$	not seen	1806
$p\overline{p}\omega$	not seen	1708
$\chi_{c1}\gamma$	not seen	778
$\chi_{c2}\gamma$	not seen	741
$\Sigma^+\overline{\Sigma}^-$	not seen	1835
$\Xi^-\overline{\Xi}^+$	not seen	1742
$pK^-\overline{\Lambda}+$ c.c.	not seen	1773
$\Lambda\overline{\Xi}^+K^-+$ c.c.	not seen	1620

$\Sigma^0\overline{\Xi}^+K^-$ + c.c.	not seen	1582

$\psi(4415)$ [i]

$I^G(J^{PC}) = 0^-(1^{--})$

Mass $m = 4415 \pm 5$ MeV
Full width $\Gamma = 110 \pm 13$ MeV (S = 1.6)

Due to the complexity of the $c\overline{c}$ threshold region, in this listing, "seen" ("not seen") means that a cross section for the mode in question has been measured at effective $\sqrt{s}$ near this particle's central mass value, more (less) than 2σ above zero, without regard to any peaking behavior in $\sqrt{s}$ or absence thereof. See mode listing(s) for details and references.

$\psi(4415)$ DECAY MODES	Fraction (Γ_i/Γ)	Confidence level	p (MeV/c)
$D\overline{D}$	seen		1181
$D^0\overline{D}^0$	seen		1181
D^+D^-	seen		1173
$D^*\overline{D}$ + c.c.	seen		1057
$D^*(2007)^0\overline{D}^0$ + c.c.	seen		1060
$D^*(2010)^+D^-$ + c.c.	seen		1052
$D^*\overline{D}^*$	seen		911
$D^*(2007)^0\overline{D}^*(2007)^0$ + c.c.	seen		919
$D^*(2010)^+D^*(2010)^-$ + c.c.	seen		911
$D^0D^-\pi^+$ (excl. $D^*(2010)^+D^-$ +c.c.	< 2.3 %	90%	–
$D\overline{D}_2^*(2460) \to D^0D^-\pi^+$+c.c.	(10 ±4) %		–
$D^0D^{*-}\pi^+$+c.c.	< 31 %	90%	918
$D_1(2420)\overline{D}$ + c.c.	possibly seen		523
$D_s^+D_s^-$	not seen		999
$\omega\chi_{c2}$	(9 ±4) $\times 10^{-3}$		317
$D_s^{*+}D_s^-$ +c.c.	seen		842
$D_s^{*+}D_s^{*-}$	seen		641
$\psi_2(3823)\pi^+\pi^-$	possibly seen		486
$\psi(3770)\pi^+\pi^-$	possibly seen		535
$J/\psi\eta$	< 1.0 %	90%	1017
$\chi_{c1}\gamma$	< 1.3 $\times 10^{-3}$	90%	811
$\chi_{c2}\gamma$	< 7 $\times 10^{-3}$	90%	775
$\Lambda\overline{\Lambda}$	< 5 $\times 10^{-6}$	90%	1905
$\Sigma^+\overline{\Sigma}^-$	< 1.8 $\times 10^{-4}$	90%	1859
$\Xi^0\overline{\Xi}^0$	< 1.4 $\times 10^{-4}$	90%	1773
$\Xi^-\overline{\Xi}^+$	< 6 $\times 10^{-5}$	90%	1768
$pK^-\overline{\Lambda}$ + c.c.	< 1.0 $\times 10^{-5}$	90%	1798
$\Lambda\overline{\Xi}^+K^-$ + c.c.	< 4 $\times 10^{-5}$	90%	1647

$\Sigma^0\overline{\Xi}^+ K^-$ + c.c.	< 2.5	$\times 10^{-4}$	90%	1610
$\omega\pi^0$	not seen			2136
$\omega\eta$	not seen			2102
e^+e^-	$(\ 3.2\pm1.2)\times 10^{-6}$			2207
$\mu^+\mu^-$	$(\ 1.1\pm0.4)\times 10^{-5}$			2205

$\psi(4660)$

$I^G(J^{PC}) = 0^-(1^{--})$

also known as $Y(4660)$; was $X(4660)$

Mass $m = 4623 \pm 10$ MeV (S = 3.7)
Full width $\Gamma = 55 \pm 9$ MeV (S = 1.9)

$\psi(4660)$ DECAY MODES	Fraction (Γ_i/Γ)	p (MeV/c)
e^+e^-	not seen	2311
$\psi(2S)\pi^+\pi^-$	seen	803
$J/\psi\eta$	not seen	1186
$D^0D^{*-}\pi^+$	not seen	1146
$D^{*0}D^{*-}\pi^+$	seen	1011
$\psi_2(3823)\pi^+\pi^-$	seen	684
$\chi_{c1}\gamma$	not seen	978
$\chi_{c1}\phi$	not seen	387
$\chi_{c2}\gamma$	not seen	943
$\chi_{c2}\phi$	not seen	275
$\Lambda_c^+\Lambda_c^-$	seen	338
$D_s^+D_{s1}(2536)^-$	seen	517
$D_s^+D_{s2}^*(2573)^-$	seen	–
$\omega\pi^0$	not seen	2243
$\omega\eta$	not seen	2211
$\Sigma^+\overline{\Sigma}^-$	not seen	1982
$\Xi^-\overline{\Xi}^+$	not seen	1896
$pK^-\overline{\Lambda}$ + c.c.	not seen	1924
$\Lambda\overline{\Xi}^+K^-$ + c.c.	not seen	1784
$\Sigma^0\overline{\Xi}^+K^-$ + c.c.	not seen	1749

NOTES

[*a*] For $E_\gamma > 100$ MeV.

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

[*c*] $\Theta(1540)$ is a hypothetical pentaquark state of 1.54 GeV/c^2 mass and a width of less than 25 MeV/c^2.

[*d*] Includes $p\overline{p}\pi^+\pi^-\gamma$ and excludes $p\overline{p}\eta$, $p\overline{p}\omega$, $p\overline{p}\eta'$.

[*e*] For a narrow state A with mass less than 960 MeV.

[*f*] For a narrow scalar or pseudoscalar A^0 with mass 0.21–3.0 GeV.

[*g*] For a dark photon U with mass between 100 and 2100 MeV.

[*h*] For a narrow resonance in the range $2.2 < M(X) < 2.8$ GeV.

[*i*] J^{PC} known by production in e^+e^- via single photon annihilation. I^G is not known; interpretation of this state as a single resonance is unclear because of the expectation of substantial threshold effects in this energy region.