$c\overline{c}$ MESONS

$\eta_c(1S)$

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

Mass $m = 2980.5 \pm 1.2$ MeV (S = 1.7)
Full width $\Gamma = 27.4 \pm 2.9$ MeV (S = 2.0)

$\eta_c(1S)$ DECAY MODES	Fraction (Γ_i/Γ)	Confidence level	p (MeV/c)
Decays involving hadronic resonances			
$\eta'(958)\pi\pi$	(4.1 ± 1.7) %		1321
$\rho\rho$	(2.0 ± 0.7) %		1273
$K^*(892)^0 K^-\pi^+ +$ c.c.	(2.0 ± 0.7) %		1276
$K^*(892)\overline{K}^*(892)$	$(9.2 \pm 3.4) \times 10^{-3}$		1194
$K^{*0}\overline{K}^{*0}\pi^+\pi^-$	(1.1 ± 0.5) %		1071
$\phi K^+ K^-$	$(2.9 \pm 1.4) \times 10^{-3}$		1102
$\phi\phi$	$(2.7 \pm 0.9) \times 10^{-3}$		1087
$\phi 2(\pi^+\pi^-)$	$< 3.5 \times 10^{-3}$	90%	1249
$a_0(980)\pi$	< 2 %	90%	1325
$a_2(1320)\pi$	< 2 %	90%	1194
$K^*(892)\overline{K} +$ c.c.	< 1.28 %	90%	1308
$f_2(1270)\eta$	< 1.1 %	90%	1143
$\omega\omega$	$< 3.1 \times 10^{-3}$	90%	1268
$\omega\phi$	$< 1.7 \times 10^{-3}$	90%	1183
$f_2(1270) f_2(1270)$	$(7.6\ ^{+3.1}_{-3.4}) \times 10^{-3}$		771
$f_2(1270) f_2'(1525)$	$(1.0\ ^{+0.5}_{-0.4})$ %		509
Decays into stable hadrons			
$K\overline{K}\pi$	(7.0 ± 1.2) %		1379
$\eta\pi\pi$	(4.9 ± 1.8) %		1427
$\pi^+\pi^- K^+ K^-$	(1.5 ± 0.6) %		1343
$K^+ K^- 2(\pi^+\pi^-)$	$(7.0 \pm 2.9) \times 10^{-3}$		1252
$2(K^+ K^-)$	$(1.5 \pm 0.7) \times 10^{-3}$		1053
$2(\pi^+\pi^-)$	(1.20 ± 0.30) %		1457
$3(\pi^+\pi^-)$	(1.5 ± 0.5) %		1405
$p\overline{p}$	$(1.3 \pm 0.4) \times 10^{-3}$		1158
$\Lambda\overline{\Lambda}$	$(1.04 \pm 0.31) \times 10^{-3}$		988
$K\overline{K}\eta$	< 3.1 %	90%	1263
$\pi^+\pi^- p\overline{p}$	< 1.2 %	90%	1025
Radiative decays			
$\gamma\gamma$	$(1.8\ ^{+0.6}_{-0.5}) \times 10^{-4}$		1490

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

$\pi^+\pi^-$	P,CP	< 6	$\times 10^{-4}$	90%	1484
$\pi^0\pi^0$	P,CP	< 4	$\times 10^{-4}$	90%	1484
K^+K^-	P,CP	< 6	$\times 10^{-4}$	90%	1406
$K^0_S K^0_S$	P,CP	< 3.1	$\times 10^{-4}$	90%	1405

$J/\psi(1S)$

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

Mass $m = 3096.916 \pm 0.011$ MeV
Full width $\Gamma = 93.2 \pm 2.1$ keV
$\Gamma_{ee} = 5.55 \pm 0.14 \pm 0.02$ keV

$J/\psi(1S)$ DECAY MODES	Fraction (Γ_i/Γ)	Scale factor/ Confidence level	p (MeV/c)
hadrons	(87.7 ±0.5) %		–
virtual $\gamma \rightarrow$ hadrons	(13.50±0.30) %		–
e^+e^-	(5.94±0.06) %		1548
$\mu^+\mu^-$	(5.93±0.06) %		1545

Decays involving hadronic resonances

$\rho\pi$	(1.69±0.15) %	S=2.4		1448
$\rho^0\pi^0$	(5.6 ±0.7) × 10^{-3}			1448
$a_2(1320)\rho$	(1.09±0.22) %			1123
$\omega\pi^+\pi^+\pi^-\pi^-$	(8.5 ±3.4) × 10^{-3}			1392
$\omega\pi^+\pi^-\pi^0$	(4.0 ±0.7) × 10^{-3}			1418
$\omega\pi^+\pi^-$	(8.6 ±0.7) × 10^{-3}	S=1.1		1435
$\omega f_2(1270)$	(4.3 ±0.6) × 10^{-3}			1142
$K^*(892)^0\overline{K}{}^*_2(1430)^0$ + c.c.	(6.0 ±0.6) × 10^{-3}			1012
$K^*(892)^0\overline{K}_2(1770)^0$ + c.c. $\rightarrow$ $K^*(892)^0K^-\pi^+$ + c.c.	(6.9 ±0.9) × 10^{-4}			–
$\omega K^*(892)\overline{K}$ + c.c.	(6.1 ±0.9) × 10^{-3}			1097
$K^+\overline{K}{}^*(892)^-$ + c.c.	(5.12±0.30) × 10^{-3}			1373
$K^+\overline{K}{}^*(892)^-$ + c.c. $\rightarrow$ $K^+K^-\pi^0$	(1.97±0.20) × 10^{-3}			–
$K^+\overline{K}{}^*(892)^-$ + c.c. $\rightarrow$ $K^0K^\pm\pi^\mp$	(3.0 ±0.4) × 10^{-3}			–
$K^0\overline{K}{}^*(892)^0$ + c.c.	(4.39±0.31) × 10^{-3}			1373
$K^0\overline{K}{}^*(892)^0$ + c.c. $\rightarrow$ $K^0K^\pm\pi^\mp$	(3.2 ±0.4) × 10^{-3}			–
$K_1(1400)^\pm K^\mp$	(3.8 ±1.4) × 10^{-3}			1170
$\overline{K}{}^*(892)^0K^+\pi^-$ + c.c.	seen			1343
$\omega\pi^0\pi^0$	(3.4 ±0.8) × 10^{-3}			1436
$b_1(1235)^\pm\pi^\mp$	[a] (3.0 ±0.5) × 10^{-3}			1300
$\omega K^\pm K^0_S\pi^\mp$	[a] (3.4 ±0.5) × 10^{-3}			1210

$b_1(1235)^0\pi^0$		$(2.3 \pm 0.6) \times 10^{-3}$		1300
$\eta K^\pm K_S^0 \pi^\mp$	[a]	$(2.2 \pm 0.4) \times 10^{-3}$		1278
$\phi K^*(892)\overline{K}$ + c.c.		$(2.18 \pm 0.23) \times 10^{-3}$		969
$\omega K \overline{K}$		$(1.6 \pm 0.5) \times 10^{-4}$		1268
$\omega f_0(1710) \rightarrow \omega K \overline{K}$		$(4.8 \pm 1.1) \times 10^{-4}$		878
$\phi 2(\pi^+\pi^-)$		$(1.66 \pm 0.23) \times 10^{-3}$		1318
$\Delta(1232)^{++}\overline{p}\pi^-$		$(1.6 \pm 0.5) \times 10^{-3}$		1030
$\omega\eta$		$(1.74 \pm 0.20) \times 10^{-3}$	S=1.6	1394
$\phi K \overline{K}$		$(1.83 \pm 0.24) \times 10^{-3}$	S=1.5	1179
$\phi f_0(1710) \rightarrow \phi K \overline{K}$		$(3.6 \pm 0.6) \times 10^{-4}$		875
$\Delta(1232)^{++}\overline{\Delta}(1232)^{--}$		$(1.10 \pm 0.29) \times 10^{-3}$		938
$\Sigma(1385)^-\overline{\Sigma}(1385)^+$ (or c.c.)	[a]	$(1.03 \pm 0.13) \times 10^{-3}$		697
$\phi f_2'(1525)$		$(8 \pm 4) \times 10^{-4}$	S=2.7	871
$\phi\pi^+\pi^-$		$(9.4 \pm 0.9) \times 10^{-4}$	S=1.2	1365
$\phi\pi^0\pi^0$		$(5.6 \pm 1.6) \times 10^{-4}$		1366
$\phi K^\pm K_S^0 \pi^\mp$	[a]	$(7.2 \pm 0.8) \times 10^{-4}$		1114
$\omega f_1(1420)$		$(6.8 \pm 2.4) \times 10^{-4}$		1062
$\phi\eta$		$(7.5 \pm 0.8) \times 10^{-4}$	S=1.5	1320
$\Xi^0\overline{\Xi}^0$		$(1.20 \pm 0.24) \times 10^{-3}$		818
$\Xi(1530)^-\overline{\Xi}^+$		$(5.9 \pm 1.5) \times 10^{-4}$		600
$pK^-\overline{\Sigma}(1385)^0$		$(5.1 \pm 3.2) \times 10^{-4}$		646
$\omega\pi^0$		$(4.5 \pm 0.5) \times 10^{-4}$	S=1.4	1446
$\phi\eta'(958)$		$(4.0 \pm 0.7) \times 10^{-4}$	S=2.1	1192
$\phi f_0(980)$		$(3.2 \pm 0.9) \times 10^{-4}$	S=1.9	1182
$\phi f_0(980) \rightarrow \phi\pi^+\pi^-$		$(1.8 \pm 0.4) \times 10^{-4}$		–
$\phi f_0(980) \rightarrow \phi\pi^0\pi^0$		$(1.7 \pm 0.7) \times 10^{-4}$		–
$\Xi(1530)^0\overline{\Xi}^0$		$(3.2 \pm 1.4) \times 10^{-4}$		608
$\Sigma(1385)^-\overline{\Sigma}^+$ (or c.c.)	[a]	$(3.1 \pm 0.5) \times 10^{-4}$		855
$\phi f_1(1285)$		$(2.6 \pm 0.5) \times 10^{-4}$	S=1.1	1032
$\eta\pi^+\pi^-$		$(4.0 \pm 1.7) \times 10^{-4}$		1487
$\rho\eta$		$(1.93 \pm 0.23) \times 10^{-4}$		1396
$\omega\eta'(958)$		$(1.82 \pm 0.21) \times 10^{-4}$		1279
$\omega f_0(980)$		$(1.4 \pm 0.5) \times 10^{-4}$		1271
$\rho\eta'(958)$		$(1.05 \pm 0.18) \times 10^{-4}$		1281
$a_2(1320)^\pm\pi^\mp$	[a]	$< 4.3 \times 10^{-3}$	CL=90%	1263
$K\overline{K}_2^*(1430)$ + c.c.		$< 4.0 \times 10^{-3}$	CL=90%	1159
$K_1(1270)^\pm K^\mp$		$< 3.0 \times 10^{-3}$	CL=90%	1231
$K_2^*(1430)^0\overline{K}_2^*(1430)^0$		$< 2.9 \times 10^{-3}$	CL=90%	604
$K^*(892)^0\overline{K}^*(892)^0$		$(2.3 \pm 0.7) \times 10^{-4}$		1266
$\phi f_2(1270)$		$(7.2 \pm 1.3) \times 10^{-4}$		1036
$\phi\eta(1405) \rightarrow \phi\eta\pi\pi$		$< 2.5 \times 10^{-4}$	CL=90%	946
$\omega f_2'(1525)$		$< 2.2 \times 10^{-4}$	CL=90%	1003
$\Sigma(1385)^0\overline{\Lambda}$		$< 2 \times 10^{-4}$	CL=90%	912

$\Delta(1232)^+\overline{p}$		$<$ 1	$\times 10^{-4}$	CL=90%	1100
$\Theta(1540)\,\overline{\Theta}(1540) \rightarrow$ $K^0_S\,p\,K^-\,\overline{n}+$ c.c.		$<$ 1.1	$\times 10^{-5}$	CL=90%	–
$\Theta(1540)\,K^-\,\overline{n} \rightarrow K^0_S\,p\,K^-\,\overline{n}$		$<$ 2.1	$\times 10^{-5}$	CL=90%	–
$\Theta(1540)\,K^0_S\,\overline{p} \rightarrow K^0_S\,\overline{p}\,K^+\,n$		$<$ 1.6	$\times 10^{-5}$	CL=90%	–
$\overline{\Theta}(1540)\,K^+\,n \rightarrow K^0_S\,\overline{p}\,K^+\,n$		$<$ 5.6	$\times 10^{-5}$	CL=90%	–
$\overline{\Theta}(1540)\,K^0_S\,p \rightarrow K^0_S\,p\,K^-\,\overline{n}$		$<$ 1.1	$\times 10^{-5}$	CL=90%	–
$\Sigma^0\,\overline{\Lambda}$		$<$ 9	$\times 10^{-5}$	CL=90%	1032
$\phi\pi^0$		$<$ 6.4	$\times 10^{-6}$	CL=90%	1377

Decays into stable hadrons

$2(\pi^+\pi^-)\pi^0$		(4.1 $\pm$0.5) %		S=2.4	1496
$3(\pi^+\pi^-)\pi^0$		(2.9 $\pm$0.6) %			1433
$\pi^+\pi^-\pi^0$		(2.07$\pm$0.13) %		S=1.7	1533
$\pi^+\pi^-\pi^0\,K^+\,K^-$		(1.79$\pm$0.29) %		S=2.2	1368
$4(\pi^+\pi^-)\pi^0$		(9.0 $\pm$3.0)	$\times 10^{-3}$		1345
$\pi^+\pi^-\,K^+\,K^-$		(6.6 $\pm$0.5)	$\times 10^{-3}$		1407
$\pi^+\pi^-\,K^+\,K^-\,\eta$		(1.84$\pm$0.28)	$\times 10^{-3}$		1221
$\pi^0\,\pi^0\,K^+\,K^-$		(2.45$\pm$0.31)	$\times 10^{-3}$		1410
$\eta\,\phi\,f_0(980) \rightarrow \eta\,\phi\,\pi^+\,\pi^-$		(3.2 $\pm$1.0)	$\times 10^{-4}$		–
$K\,\overline{K}\,\pi$		(6.1 $\pm$1.0)	$\times 10^{-3}$		1442
$2(\pi^+\pi^-)$		(3.55$\pm$0.23)	$\times 10^{-3}$		1517
$3(\pi^+\pi^-)$		(4.3 $\pm$0.4)	$\times 10^{-3}$		1466
$2(\pi^+\pi^-\pi^0)$		(1.62$\pm$0.21) %			1468
$2(\pi^+\pi^-)\eta$		(2.29$\pm$0.24)	$\times 10^{-3}$		1446
$3(\pi^+\pi^-)\eta$		(7.2 $\pm$1.5)	$\times 10^{-4}$		1379
$p\,\overline{p}$		(2.17$\pm$0.07)	$\times 10^{-3}$		1232
$p\,\overline{p}\,\pi^0$		(1.09$\pm$0.09)	$\times 10^{-3}$		1176
$p\,\overline{p}\,\pi^+\,\pi^-$		(6.0 $\pm$0.5)	$\times 10^{-3}$	S=1.3	1107
$p\,\overline{p}\,\pi^+\,\pi^-\,\pi^0$	[b]	(2.3 $\pm$0.9)	$\times 10^{-3}$	S=1.9	1033
$p\,\overline{p}\,\eta$		(2.09$\pm$0.18)	$\times 10^{-3}$		948
$p\,\overline{p}\,\rho$		$<$ 3.1	$\times 10^{-4}$	CL=90%	774
$p\,\overline{p}\,\omega$		(1.10$\pm$0.15)	$\times 10^{-3}$	S=1.3	768
$p\,\overline{p}\,\eta'(958)$		(9 $\pm$4)	$\times 10^{-4}$	S=1.7	596
$p\,\overline{p}\,\phi$		(4.5 $\pm$1.5)	$\times 10^{-5}$		527
$n\,\overline{n}$		(2.2 $\pm$0.4)	$\times 10^{-3}$		1231
$n\,\overline{n}\,\pi^+\,\pi^-$		(4 $\pm$4)	$\times 10^{-3}$		1106
$\Sigma^+\,\overline{\Sigma}^-$		(1.50$\pm$0.24)	$\times 10^{-3}$		992
$\Sigma^0\,\overline{\Sigma}^0$		(1.29$\pm$0.09)	$\times 10^{-3}$		988
$2(\pi^+\pi^-)\,K^+\,K^-$		(4.7 $\pm$0.7)	$\times 10^{-3}$	S=1.3	1320
$p\,\overline{n}\,\pi^-$		(2.12$\pm$0.09)	$\times 10^{-3}$		1174
$n\,N(1440)$		seen			978
$n\,N(1520)$		seen			924
$n\,N(1535)$		seen			914

$\Xi^-\overline{\Xi}^+$		$(8.5 \pm 1.6) \times 10^{-4}$	S=1.5	807
$\Lambda\overline{\Lambda}$		$(1.61 \pm 0.15) \times 10^{-3}$	S=2.0	1074
$\Lambda\overline{\Sigma}^-\pi^+$ (or c.c.)	[a]	$(8.3 \pm 0.7) \times 10^{-4}$	S=1.2	950
$pK^-\overline{\Lambda}$		$(8.9 \pm 1.6) \times 10^{-4}$		876
$2(K^+K^-)$		$(7.6 \pm 0.9) \times 10^{-4}$		1131
$pK^-\overline{\Sigma}^0$		$(2.9 \pm 0.8) \times 10^{-4}$		819
K^+K^-		$(2.37 \pm 0.31) \times 10^{-4}$		1468
$K^0_S K^0_L$		$(1.46 \pm 0.26) \times 10^{-4}$	S=2.7	1466
$\Lambda\overline{\Lambda}\eta$		$(2.6 \pm 0.7) \times 10^{-4}$		672
$\Lambda\overline{\Lambda}\pi^0$		$< 6.4 \times 10^{-5}$	CL=90%	998
$\overline{\Lambda}nK^0_S$ + c.c.		$(6.5 \pm 1.1) \times 10^{-4}$		872
$\pi^+\pi^-$		$(1.47 \pm 0.23) \times 10^{-4}$		1542
$\Lambda\overline{\Sigma}$ + c.c.		$< 1.5 \times 10^{-4}$	CL=90%	1034
$K^0_S K^0_S$		$< 1 \times 10^{-6}$	CL=95%	1466

Radiative decays

3γ		$(1.2 \pm 0.4) \times 10^{-5}$		1548
4γ		$< 9 \times 10^{-6}$	CL=90%	1548
5γ		$< 1.5 \times 10^{-5}$	CL=90%	1548
$\gamma\eta_c(1S)$		(1.7 $\pm$0.4) %	S=1.7	114
$\gamma\eta_c(1S) \rightarrow 3\gamma$		$(1.2 \, ^{+2.7}_{-1.1}) \times 10^{-6}$		–
$\gamma\pi^+\pi^- 2\pi^0$		$(8.3 \pm 3.1) \times 10^{-3}$		1518
$\gamma\eta\pi\pi$		$(6.1 \pm 1.0) \times 10^{-3}$		1487
$\gamma\eta_2(1870) \rightarrow \gamma\eta\pi^+\pi^-$		$(6.2 \pm 2.4) \times 10^{-4}$		–
$\gamma\eta(1405/1475) \rightarrow \gamma K\overline{K}\pi$	[c]	$(2.8 \pm 0.6) \times 10^{-3}$	S=1.6	1223
$\gamma\eta(1405/1475) \rightarrow \gamma\gamma\rho^0$		$(7.8 \pm 2.0) \times 10^{-5}$	S=1.8	1223
$\gamma\eta(1405/1475) \rightarrow \gamma\eta\pi^+\pi^-$		$(3.0 \pm 0.5) \times 10^{-4}$		–
$\gamma\eta(1405/1475) \rightarrow \gamma\gamma\phi$		$< 8.2 \times 10^{-5}$	CL=95%	–
$\gamma\rho\rho$		$(4.5 \pm 0.8) \times 10^{-3}$		1340
$\gamma\rho\omega$		$< 5.4 \times 10^{-4}$	CL=90%	1338
$\gamma\rho\phi$		$< 8.8 \times 10^{-5}$	CL=90%	1258
$\gamma\eta'(958)$		$(4.71 \pm 0.27) \times 10^{-3}$	S=1.1	1400
$\gamma 2\pi^+ 2\pi^-$		$(2.8 \pm 0.5) \times 10^{-3}$	S=1.9	1517
$\gamma f_2(1270) f_2(1270)$		$(9.5 \pm 1.7) \times 10^{-4}$		879
$\gamma f_2(1270) f_2(1270)$ (non resonant)		$(8.2 \pm 1.9) \times 10^{-4}$		–
$\gamma K^+K^-\pi^+\pi^-$		$(2.1 \pm 0.6) \times 10^{-3}$		1407
$\gamma f_4(2050)$		$(2.7 \pm 0.7) \times 10^{-3}$		891
$\gamma\omega\omega$		$(1.61 \pm 0.33) \times 10^{-3}$		1336
$\gamma\eta(1405/1475) \rightarrow \gamma\rho^0\rho^0$		$(1.7 \pm 0.4) \times 10^{-3}$	S=1.3	1223
$\gamma f_2(1270)$		$(1.43 \pm 0.11) \times 10^{-3}$		1286
$\gamma f_0(1710) \rightarrow \gamma K\overline{K}$		$(8.5 \, ^{+1.2}_{-0.9}) \times 10^{-4}$	S=1.2	1075
$\gamma f_0(1710) \rightarrow \gamma\pi\pi$		$(4.0 \pm 1.0) \times 10^{-4}$		–

$\gamma f_0(1710) \rightarrow \gamma\omega\omega$	$(3.1 \pm 1.0) \times 10^{-4}$			–
$\gamma\eta$	$(9.8 \pm 1.0) \times 10^{-4}$	S=1.7		1500
$\gamma f_1(1420) \rightarrow \gamma K\overline{K}\pi$	$(7.9 \pm 1.3) \times 10^{-4}$			1220
$\gamma f_1(1285)$	$(6.1 \pm 0.8) \times 10^{-4}$			1283
$\gamma f_1(1510) \rightarrow \gamma\eta\pi^+\pi^-$	$(4.5 \pm 1.2) \times 10^{-4}$			–
$\gamma f_2'(1525)$	$(4.5 \ ^{+0.7}_{-0.4}) \times 10^{-4}$			1173
$\gamma f_2(1640) \rightarrow \gamma\omega\omega$	$(2.8 \pm 1.8) \times 10^{-4}$			–
$\gamma f_2(1910) \rightarrow \gamma\omega\omega$	$(2.0 \pm 1.4) \times 10^{-4}$			–
$\gamma f_2(1950) \rightarrow \gamma K^*(892)\overline{K}^*(892)$	$(7.0 \pm 2.2) \times 10^{-4}$			–
$\gamma K^*(892)\overline{K}^*(892)$	$(4.0 \pm 1.3) \times 10^{-3}$			1266
$\gamma\phi\phi$	$(4.0 \pm 1.2) \times 10^{-4}$	S=2.1		1166
$\gamma p\overline{p}$	$(3.8 \pm 1.0) \times 10^{-4}$			1232
$\gamma\eta(2225)$	$(3.3 \pm 0.5) \times 10^{-4}$			749
$\gamma\eta(1760) \rightarrow \gamma\rho^0\rho^0$	$(1.3 \pm 0.9) \times 10^{-4}$			1048
$\gamma\eta(1760) \rightarrow \gamma\omega\omega$	$(1.98 \pm 0.33) \times 10^{-3}$			–
$\gamma X(1835)$	$(2.2 \pm 0.6) \times 10^{-4}$			1006
$\gamma(K\overline{K}\pi)\ [J^{PC} = 0^{-+}]$	$(7 \pm 4) \times 10^{-4}$	S=2.1		1442
$\gamma\pi^0$	$(3.3 \ ^{+0.6}_{-0.4}) \times 10^{-5}$			1546
$\gamma p\overline{p}\pi^+\pi^-$	$< 7.9 \times 10^{-4}$	CL=90%		1107
$\gamma\Lambda\overline{\Lambda}$	$< 1.3 \times 10^{-4}$	CL=90%		1074
$\gamma f_J(2220)$	$> 2.50 \times 10^{-3}$	CL=99.9%		745
$\gamma f_J(2220) \rightarrow \gamma\pi\pi$	$(8 \pm 4) \times 10^{-5}$			–
$\gamma f_J(2220) \rightarrow \gamma K\overline{K}$	$(8.1 \pm 3.0) \times 10^{-5}$			–
$\gamma f_J(2220) \rightarrow \gamma p\overline{p}$	$(1.5 \pm 0.8) \times 10^{-5}$			–
$\gamma f_0(1500)$	$> (5.7 \pm 0.8) \times 10^{-4}$			1183
$\gamma e^+ e^-$	$(8.8 \pm 1.4) \times 10^{-3}$			1548

Weak decays

$D^- e^+ \nu_e +$ c.c.	$< 1.2 \times 10^{-5}$	CL=90%		984
$\overline{D}^0 e^+ e^- +$ c.c.	$< 1.1 \times 10^{-5}$	CL=90%		987
$D_s^- e^+ \nu_e +$ c.c.	$< 3.6 \times 10^{-5}$	CL=90%		923
$D^- \pi^+ +$ c.c.	$< 7.5 \times 10^{-5}$	CL=90%		977
$\overline{D}^0 K^0 +$ c.c.	$< 1.7 \times 10^{-4}$	CL=90%		898
$D_s^- \pi^+ +$ c.c.	$< 1.3 \times 10^{-4}$	CL=90%		915

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

$\gamma\gamma$	C	$< 5 \times 10^{-6}$	CL=90%		1548
$e^\pm\mu^\mp$	LF	$< 1.1 \times 10^{-6}$	CL=90%		1547
$e^\pm\tau^\mp$	LF	$< 8.3 \times 10^{-6}$	CL=90%		1039
$\mu^\pm\tau^\mp$	LF	$< 2.0 \times 10^{-6}$	CL=90%		1035

Other decays

invisible	< 7	$\times 10^{-4}$	CL=90%	–

$\chi_{c0}(1P)$ $I^G(J^{PC}) = 0^+(0^{++})$

Mass $m = 3414.75 \pm 0.31$ MeV
Full width $\Gamma = 10.4 \pm 0.7$ MeV

$\chi_{c0}(1P)$ DECAY MODES	Fraction (Γ_i/Γ)	Scale factor/ Confidence level	p (MeV/c)
Hadronic decays			
$2(\pi^+\pi^-)$	(2.25 ± 0.19) %		1679
$\rho^0\pi^+\pi^-$	$(8.8 \pm2.8) \times 10^{-3}$		1607
$f_0(980)f_0(980)$	$(6.9 \pm2.2) \times 10^{-4}$		1398
$\pi^+\pi^-\pi^0\pi^0$	(3.5 ± 0.4) %		1680
$\rho^+\pi^-\pi^0$ + c.c.	(3.0 ± 0.5) %		1607
$\pi^+\pi^-K^+K^-$	(1.80 ± 0.15) %		1580
$K_0^*(1430)^0\overline{K}_0^*(1430)^0 \to \pi^+\pi^-K^+K^-$	$(1.02^{+0.40}_{-0.29}) \times 10^{-3}$		–
$K_0^*(1430)^0\overline{K}_2^*(1430)^0$ + c.c. $\to \pi^+\pi^-K^+K^-$	$(8.3 ^{+2.0}_{-2.5}) \times 10^{-4}$		–
$K_1(1270)^+K^-$ + c.c. $\to \pi^+\pi^-K^+K^-$	$(6.5 \pm2.0) \times 10^{-3}$		–
$K_1(1400)^+K^-$ + c.c. $\to \pi^+\pi^-K^+K^-$	< 2.8 $\times 10^{-3}$	CL=90%	–
$f_0(980)f_0(980)$	$(1.7 ^{+1.1}_{-0.9}) \times 10^{-4}$		1398
$f_0(980)f_0(2200)$	$(8.2 ^{+2.1}_{-2.6}) \times 10^{-4}$		595
$f_0(1370)f_0(1370)$	< 2.8 $\times 10^{-4}$	CL=90%	1019
$f_0(1370)f_0(1500)$	< 1.8 $\times 10^{-4}$	CL=90%	920
$f_0(1370)f_0(1710)$	$(7.0 ^{+4.0}_{-2.4}) \times 10^{-4}$		723
$f_0(1500)f_0(1370)$	< 1.4 $\times 10^{-4}$	CL=90%	920
$f_0(1500)f_0(1500)$	< 5 $\times 10^{-5}$	CL=90%	805
$f_0(1500)f_0(1710)$	< 7 $\times 10^{-5}$	CL=90%	559
$K^+K^-\pi^0\pi^0$	$(5.8 \pm0.9) \times 10^{-3}$		1582
$K^+\pi^-K^0\pi^0$ + c.c.	(2.58 ± 0.35) %		1581
$\rho^+K^-K^0$ + c.c.	(1.25 ± 0.22) %		1458
$K^*(892)^-K^+\pi^0 \to K^+\pi^-K^0\pi^0$ + c.c.	$(4.8 \pm1.2) \times 10^{-3}$		–
$K_S^0K_S^0\pi^+\pi^-$	$(5.9 \pm1.1) \times 10^{-3}$		1579
$K^+K^-\eta\pi^0$	$(3.1 \pm0.7) \times 10^{-3}$		1468
$3(\pi^+\pi^-)$	(1.20 ± 0.18) %		1633
$K^+\overline{K}^*(892)^0\pi^-$ + c.c.	$(7.3 \pm1.6) \times 10^{-3}$		1523

$K^*(892)^0\overline{K}^*(892)^0$	$(1.8 \pm 0.6) \times 10^{-3}$		1456
$\pi\pi$	$(7.2 \pm 0.6) \times 10^{-3}$		1702
$\pi^0\eta$	$< 1.7 \times 10^{-4}$		1661
$\pi^0\eta'$	$< 1.0 \times 10^{-3}$		1570
$\eta\eta$	$(2.2 \pm 0.4) \times 10^{-3}$		1617
$\eta\eta'$	$< 5 \times 10^{-4}$	CL=90%	1521
$\eta'\eta'$	$(1.7 \pm 0.4) \times 10^{-3}$		1413
$\omega\omega$	$(2.2 \pm 0.7) \times 10^{-3}$		1517
K^+K^-	$(5.8 \pm 0.6) \times 10^{-3}$		1634
$K^0_S K^0_S$	$(2.84 \pm 0.28) \times 10^{-3}$		1633
$\pi^+\pi^-\eta$	$< 2.1 \times 10^{-4}$	CL=90%	1651
$\pi^+\pi^-\eta'$	$< 4 \times 10^{-4}$	CL=90%	1560
$\overline{K}^0 K^+\pi^-$ + c.c.	$< 1.0 \times 10^{-4}$	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
$K^+K^-K^0_S K^0_S$	$(1.5 \pm 0.5) \times 10^{-3}$		1331
$K^+K^-K^+K^-$	$(2.83 \pm 0.30) \times 10^{-3}$		1333
$K^+K^-\phi$	$(1.01 \pm 0.26) \times 10^{-3}$		1381
$\phi\phi$	$(9.3 \pm 1.9) \times 10^{-4}$		1370
$p\overline{p}$	$(2.39 \pm 0.15) \times 10^{-4}$		1426
$p\overline{p}\pi^0$	$(5.8 \pm 1.2) \times 10^{-4}$		1379
$p\overline{p}\eta$	$(3.8 \pm 1.1) \times 10^{-4}$		1187
$\pi^+\pi^- p\overline{p}$	$(2.1 \pm 0.7) \times 10^{-3}$	S=1.4	1320
$\pi^0\pi^0 p\overline{p}$	$(1.08 \pm 0.29) \times 10^{-3}$		1324
$K^0_S K^0_S p\overline{p}$	$< 8.8 \times 10^{-4}$	CL=90%	884
$p\overline{n}\pi^-$	$(1.17 \pm 0.32) \times 10^{-3}$		1376
$\Lambda\overline{\Lambda}$	$(3.4 \pm 0.4) \times 10^{-4}$		1292
$\Lambda\overline{\Lambda}\pi^+\pi^-$	$< 4.0 \times 10^{-3}$	CL=90%	1153
$K^+\overline{p}\Lambda$ + c.c.	$(1.05 \pm 0.20) \times 10^{-3}$		1132
$\Sigma^0\overline{\Sigma}^0$	$(4.3 \pm 0.7) \times 10^{-4}$		1222
$\Sigma^+\overline{\Sigma}^-$	$(3.2 \pm 0.7) \times 10^{-4}$		1225
$\Xi^0\overline{\Xi}^0$	$(3.3 \pm 0.8) \times 10^{-4}$		1089
$\Xi^-\overline{\Xi}^+$	$(5.0 \pm 0.7) \times 10^{-4}$		1081

Radiative decays

$\gamma J/\psi(1S)$	(1.14 ± 0.08) %		303
$\gamma\rho^0$	$< 9 \times 10^{-6}$	CL=90%	1619
$\gamma\omega$	$< 9 \times 10^{-6}$	CL=90%	1618
$\gamma\phi$	$< 6 \times 10^{-6}$	CL=90%	1555
$\gamma\gamma$	$(2.27 \pm 0.18) \times 10^{-4}$		1707

$\chi_{c1}(1P)$

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

Mass $m = 3510.66 \pm 0.07$ MeV (S = 1.5)
Full width $\Gamma = 0.86 \pm 0.05$ MeV

$\chi_{c1}(1P)$ DECAY MODES	Fraction (Γ_i/Γ)	Scale factor/ Confidence level	p (MeV/c)
Hadronic decays			
$3(\pi^+\pi^-)$	$(5.8 \pm 1.4) \times 10^{-3}$	S=1.2	1683
$2(\pi^+\pi^-)$	$(7.6 \pm 2.6) \times 10^{-3}$		1728
$\pi^+\pi^-\pi^0\pi^0$	(1.26±0.17) %		1729
$\rho^+\pi^-\pi^0$ + c.c.	(1.53±0.26) %		1658
$\rho^0\pi^+\pi^-$	$(3.9 \pm 3.5) \times 10^{-3}$		1657
$\pi^+\pi^- K^+ K^-$	$(4.5 \pm 1.0) \times 10^{-3}$		1632
$K^+ K^-\pi^0\pi^0$	$(1.18\pm0.29) \times 10^{-3}$		1634
$K^+\pi^- K^0\pi^0$ + c.c.	$(9.0 \pm 1.5) \times 10^{-3}$		1632
$\rho^+ K^- K^0$ + c.c.	$(5.3 \pm 1.3) \times 10^{-3}$		1514
$K^*(892)^0 K^0\pi^0 \to K^+\pi^- K^0\pi^0$ + c.c.	$(2.5 \pm 0.7) \times 10^{-3}$		–
$K^+ K^-\eta\pi^0$	$(1.2 \pm 0.4) \times 10^{-3}$		1523
$\pi^+\pi^- K^0_S K^0_S$	$(7.3 \pm 3.1) \times 10^{-4}$		1630
$K^+ K^-\eta$	$(3.3 \pm 1.0) \times 10^{-4}$		1566
$K^0 K^+\pi^-$ + c.c.	$(7.3 \pm 0.6) \times 10^{-3}$		1661
$K^*(892)^0\overline{K}^0$ + c.c.	$(1.0 \pm 0.4) \times 10^{-3}$		1602
$K^*(892)^+ K^-$ + c.c.	$(1.5 \pm 0.7) \times 10^{-3}$		1602
$K^*_J(1430)^0\overline{K}^0$ + c.c. $\to K^0_S K^+\pi^-$ + c.c.	$< 8 \times 10^{-4}$	CL=90%	–
$K^*_J(1430)^+ K^-$ + c.c. $\to K^0_S K^+\pi^-$ + c.c.	$< 2.3 \times 10^{-3}$	CL=90%	–
$K^+ K^-\pi^0$	$(1.92\pm0.26) \times 10^{-3}$		1662
$\eta\pi^+\pi^-$	$(5.0 \pm 0.5) \times 10^{-3}$		1701
$a_0(980)^+\pi^-$ + c.c. $\to \eta\pi^+\pi^-$	$(1.9 \pm 0.7) \times 10^{-3}$		–
$f_2(1270)\eta$	$(2.8 \pm 0.8) \times 10^{-3}$		1468
$\pi^+\pi^-\eta'$	$(2.4 \pm 0.5) \times 10^{-3}$		1612
$K^+\overline{K}^*(892)^0\pi^-$ + c.c.	$(3.2 \pm 2.1) \times 10^{-3}$		1577
$K^*(892)^0\overline{K}^*(892)^0$	$(1.5 \pm 0.4) \times 10^{-3}$		1512
$K^+ K^- K^0_S K^0_S$	$< 5 \times 10^{-4}$	CL=90%	1390
$K^+ K^- K^+ K^-$	$(5.6 \pm 1.2) \times 10^{-4}$		1393
$K^+ K^-\phi$	$(4.3 \pm 1.6) \times 10^{-4}$		1440
$p\overline{p}$	$(7.4 \pm 0.4) \times 10^{-5}$		1484
$p\overline{p}\pi^0$	$(1.2 \pm 0.5) \times 10^{-4}$		1438
$p\overline{p}\eta$	$< 1.6 \times 10^{-4}$	CL=90%	1254
$\pi^+\pi^- p\overline{p}$	$(5.0 \pm 1.9) \times 10^{-4}$		1381
$K^0_S K^0_S p\overline{p}$	$< 4.5 \times 10^{-4}$	CL=90%	968
$\Lambda\overline{\Lambda}$	$(1.19\pm0.19) \times 10^{-4}$		1355

$\Lambda\overline{\Lambda}\pi^+\pi^-$	$<$ 1.5	$\times 10^{-3}$	CL=90%	1223
$K^+\overline{p}\Lambda$	(3.2 $\pm$1.0)	$\times 10^{-4}$		1203
$\Sigma^0\overline{\Sigma}^0$	$<$ 4	$\times 10^{-5}$	CL=90%	1288
$\Sigma^+\overline{\Sigma}^-$	$<$ 6	$\times 10^{-5}$	CL=90%	1291
$\Xi^0\overline{\Xi}^0$	$<$ 6	$\times 10^{-5}$	CL=90%	1163
$\Xi^-\overline{\Xi}^+$	(8.4 $\pm$2.3)	$\times 10^{-5}$		1155
$\pi^+\pi^- + K^+K^-$	$<$ 2.1	$\times 10^{-3}$		–
$K^0_S K^0_S$	$<$ 6	$\times 10^{-5}$	CL=90%	1683

Radiative decays

$\gamma J/\psi(1S)$	(34.1 $\pm$1.5) %			389
$\gamma\rho^0$	(2.29$\pm$0.27)	$\times 10^{-4}$		1670
$\gamma\omega$	(7.8 $\pm$1.8)	$\times 10^{-5}$		1668
$\gamma\phi$	$<$ 2.5	$\times 10^{-5}$	CL=90%	1607

$h_c(1P)$

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

Mass $m = 3525.67 \pm 0.32$ MeV (S = 2.3)
Full width $\Gamma < 1$ MeV

$h_c(1P)$ DECAY MODES	Fraction (Γ_i/Γ)	p (MeV/c)
$J/\psi(1S)\pi\pi$	not seen	313
$\eta_c\gamma$	seen	503

$\chi_{c2}(1P)$

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

Mass $m = 3556.20 \pm 0.09$ MeV
Full width $\Gamma = 1.98 \pm 0.11$ MeV

$\chi_{c2}(1P)$ DECAY MODES	Fraction (Γ_i/Γ)	Confidence level	p (MeV/c)
Hadronic decays			
$2(\pi^+\pi^-)$	(1.09±0.11) %		1751
$\pi^+\pi^-\pi^0\pi^0$	(2.01±0.26) %		1752
$\rho^+\pi^-\pi^0$ + c.c.	(2.4 ±0.4) %		1682
$K^+K^-\pi^0\pi^0$	(2.3 ±0.5) × 10^{-3}		1658
$K^+\pi^-K^0\pi^0$ + c.c.	(1.51±0.22) %		1657
$\rho^+K^-K^0$ + c.c.	(4.5 ±1.4) × 10^{-3}		1540
$K^*(892)^0K^+\pi^- \to K^+\pi^-K^0\pi^0$ + c.c.	(3.2 ±0.9) × 10^{-3}		–
$K^*(892)^0K^0\pi^0 \to K^+\pi^-K^0\pi^0$ + c.c.	(4.2 ±1.0) × 10^{-3}		–
$K^*(892)^-K^+\pi^0 \to K^+\pi^-K^0\pi^0$ + c.c.	(4.1 ±0.9) × 10^{-3}		–
$K^*(892)^+K^0\pi^- \to K^+\pi^-K^0\pi^0$ + c.c.	(3.2 ±0.9) × 10^{-3}		–
$K^+K^-\eta\pi^0$	(1.4 ±0.5) × 10^{-3}		1549
$\pi^+\pi^-K^+K^-$	(9.0 ±1.1) × 10^{-3}		1656
$K^+\overline{K}^*(892)^0\pi^-$ + c.c.	(2.3 ±1.2) × 10^{-3}		1602
$K^*(892)^0\overline{K}^*(892)^0$	(2.5 ±0.5) × 10^{-3}		1538
$3(\pi^+\pi^-)$	(8.6 ±1.8) × 10^{-3}		1707
$\phi\phi$	(1.47±0.28) × 10^{-3}		1457
$\omega\omega$	(1.9 ±0.6) × 10^{-3}		1597
$\pi\pi$	(2.09±0.23) × 10^{-3}		1773
$\rho^0\pi^+\pi^-$	(3.9 ±1.7) × 10^{-3}		1681
$\pi^+\pi^-\eta$	(5.3 ±1.4) × 10^{-4}		1724
$\pi^+\pi^-\eta'$	(5.5 ±2.0) × 10^{-4}		1636
$\eta\eta$	< 5 × 10^{-4}	90%	1692
K^+K^-	(7.6 ±1.3) × 10^{-4}		1708
$K^0_SK^0_S$	(6.2 ±0.8) × 10^{-4}		1707
$\overline{K}^0K^+\pi^-$ + c.c.	(1.33±0.20) × 10^{-3}		1685
$K^+K^-\pi^0$	(3.3 ±0.8) × 10^{-4}		1686
$K^+K^-\eta$	< 3.5 × 10^{-4}	90%	1592
$\eta\eta'$	< 2.5 × 10^{-4}	90%	1600
$\eta'\eta'$	< 3.3 × 10^{-4}	90%	1498
$\pi^+\pi^-K^0_SK^0_S$	(2.4 ±0.6) × 10^{-3}		1655
$K^+K^-K^0_SK^0_S$	< 4 × 10^{-4}	90%	1418
$K^+K^-K^+K^-$	(1.77±0.22) × 10^{-3}		1421
$K^+K^-\phi$	(1.56±0.33) × 10^{-3}		1468
$K^0_SK^0_Sp\overline{p}$	< 7.9 × 10^{-4}	90%	1007
$p\overline{p}$	(7.2 ±0.4) × 10^{-5}		1510
$p\overline{p}\pi^0$	(4.7 ±1.0) × 10^{-4}		1465

$p\overline{p}\eta$	(2.0 ±0.8) × 10^{-4}			1285
$\pi^+\pi^- p\overline{p}$	(1.32±0.34) × 10^{-3}			1410
$\pi^0\pi^0 p\overline{p}$	(8.6 ±2.6) × 10^{-4}			1414
$p\overline{n}\pi^-$	(1.1 ±0.4) × 10^{-3}			1463
$\Lambda\overline{\Lambda}$	(1.87±0.27) × 10^{-4}			1385
$\Lambda\overline{\Lambda}\pi^+\pi^-$	< 3.5	× 10^{-3}	90%	1255
$K^+\overline{p}\Lambda$ + c.c.	(9.1 ±1.8) × 10^{-4}			1236
$\Sigma^0\overline{\Sigma}^0$	< 8	× 10^{-5}	90%	1319
$\Sigma^+\overline{\Sigma}^-$	< 7	× 10^{-5}	90%	1322
$\Xi^0\overline{\Xi}^0$	< 1.1	× 10^{-4}	90%	1197
$\Xi^-\overline{\Xi}^+$	(1.56±0.35) × 10^{-4}			1189
$J/\psi(1S)\pi^+\pi^-\pi^0$	< 1.5	%	90%	185
Radiative decays				
$\gamma J/\psi(1S)$	(19.4 ±0.8) %			430
$\gamma\rho^0$	< 5	× 10^{-5}	90%	1694
$\gamma\omega$	< 7	× 10^{-6}	90%	1692
$\gamma\phi$	< 1.2	× 10^{-5}	90%	1632
$\gamma\gamma$	(2.60±0.16) × 10^{-4}			1778

$\eta_c(2S)$

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

Quantum numbers are quark model predictions.

Mass $m = 3637 \pm 4$ MeV (S = 1.7)
Full width $\Gamma = 14 \pm 7$ MeV

$\eta_c(2S)$ DECAY MODES	Fraction (Γ_i/Γ)	Confidence level	p (MeV/c)
hadrons	not seen		–
$K\overline{K}\pi$	(1.9±1.2) %		1729
$2\pi^+2\pi^-$	not seen		1792
$K^+K^-\pi^+\pi^-$	not seen		1700
$2K^+2K^-$	not seen		1470
$p\overline{p}$	not seen		1558
$\gamma\gamma$	< 5 × 10^{-4}	90%	1819

$\psi(2S)$

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

Mass $m = 3686.09 \pm 0.04$ MeV (S = 1.6)
Full width $\Gamma = 309 \pm 9$ keV
$\Gamma_{ee} = 2.36 \pm 0.04$ keV

$\psi(2S)$ DECAY MODES	Fraction (Γ_i/Γ)	Scale factor/ Confidence level	p (MeV/c)
hadrons	(97.85±0.13) %		–
virtual $\gamma \rightarrow$ hadrons	(1.73±0.14) %	S=1.5	–
light hadrons	(15.4 ±1.5) %		–
$e^+ e^-$	(7.65±0.17) × 10^{-3}		1843
$\mu^+ \mu^-$	(7.6 ±0.8) × 10^{-3}		1840
$\tau^+ \tau^-$	(3.0 ±0.4) × 10^{-3}		490
Decays into $J/\psi(1S)$ and anything			
$J/\psi(1S)$ anything	(58.7 ±0.8) %		–
$J/\psi(1S)$ neutrals	(24.3 ±0.4) %		–
$J/\psi(1S)\pi^+\pi^-$	(33.1 ±0.5) %		477
$J/\psi(1S)\pi^0\pi^0$	(17.51±0.34) %		481
$J/\psi(1S)\eta$	(3.24±0.07) %		199
$J/\psi(1S)\pi^0$	(1.30±0.10) × 10^{-3}	S=1.4	528
Hadronic decays			
$3(\pi^+\pi^-)\pi^0$	(3.5 ±1.6) × 10^{-3}		1746
$2(\pi^+\pi^-)\pi^0$	(2.9 ±1.0) × 10^{-3}	S=4.6	1799
$\rho a_2(1320)$	(2.6 ±0.9) × 10^{-4}		1500
$p\overline{p}$	(2.75±0.12) × 10^{-4}		1586
$\Delta^{++}\overline{\Delta}^{--}$	(1.28±0.35) × 10^{-4}		1371
$\Lambda\overline{\Lambda}\pi^0$	< 1.2 × 10^{-4}	CL=90%	1412
$\Lambda\overline{\Lambda}\eta$	< 4.9 × 10^{-5}	CL=90%	1197
$\Lambda\overline{p}K^+$	(1.00±0.14) × 10^{-4}		1327
$\Lambda\overline{p}K^+\pi^+\pi^-$	(1.8 ±0.4) × 10^{-4}		1167
$\Lambda\overline{\Lambda}\pi^+\pi^-$	(2.8 ±0.6) × 10^{-4}		1346
$\Lambda\overline{\Lambda}$	(2.8 ±0.5) × 10^{-4}	S=2.6	1467
$\Sigma^+\overline{\Sigma}^-$	(2.6 ±0.8) × 10^{-4}		1408
$\Sigma^0\overline{\Sigma}^0$	(2.2 ±0.4) × 10^{-4}	S=1.5	1405
$\Sigma(1385)^+\overline{\Sigma}(1385)^-$	(1.1 ±0.4) × 10^{-4}		1218
$\Xi^-\overline{\Xi}^+$	(1.8 ±0.6) × 10^{-4}	S=2.8	1284
$\Xi^0\overline{\Xi}^0$	(2.8 ±0.9) × 10^{-4}		1291
$\Xi(1530)^0\overline{\Xi}(1530)^0$	< 8.1 × 10^{-5}	CL=90%	1025
$\Omega^-\overline{\Omega}^+$	< 7.3 × 10^{-5}	CL=90%	774
$\pi^0 p\overline{p}$	(1.33±0.17) × 10^{-4}		1543
$\eta p\overline{p}$	(6.0 ±1.2) × 10^{-5}		1373
$\omega p\overline{p}$	(6.9 ±2.1) × 10^{-5}		1247
$\phi p\overline{p}$	< 2.4 × 10^{-5}	CL=90%	1109
$\pi^+\pi^- p\overline{p}$	(6.0 ±0.4) × 10^{-4}		1491
$p\overline{n}\pi^-$ or c.c.	(2.48±0.17) × 10^{-4}		–
$p\overline{n}\pi^-\pi^0$	(3.2 ±0.7) × 10^{-4}		1492
$2(\pi^+\pi^-\pi^0)$	(4.7 ±1.5) × 10^{-3}		1776
$\eta\pi^+\pi^-$	< 1.6 × 10^{-4}	CL=90%	1791

$\eta\pi^+\pi^-\pi^0$	$(9.5 \pm 1.7) \times 10^{-4}$		1778
$2(\pi^+\pi^-)\eta$	$(1.2 \pm 0.6) \times 10^{-3}$		1758
$\eta'\pi^+\pi^-\pi^0$	$(4.5 \pm 2.1) \times 10^{-4}$		1692
$\omega\pi^+\pi^-$	$(7.3 \pm 1.2) \times 10^{-4}$	S=2.1	1748
$b_1^\pm\pi^\mp$	$(4.0 \pm 0.6) \times 10^{-4}$	S=1.1	1635
$b_1^0\pi^0$	$(2.4 \pm 0.6) \times 10^{-4}$		–
$\omega f_2(1270)$	$(2.2 \pm 0.4) \times 10^{-4}$		1515
$\pi^+\pi^-K^+K^-$	$(7.5 \pm 0.9) \times 10^{-4}$	S=1.9	1726
$\rho^0 K^+K^-$	$(2.2 \pm 0.4) \times 10^{-4}$		1616
$K^*(892)^0\overline{K}_2^*(1430)^0$	$(1.9 \pm 0.5) \times 10^{-4}$		1418
$K^+K^-\pi^+\pi^-\eta$	$(1.3 \pm 0.7) \times 10^{-3}$		1574
$K^+K^-2(\pi^+\pi^-)\pi^0$	$(1.00\pm 0.31) \times 10^{-3}$		1611
$K^+K^-2(\pi^+\pi^-)$	$(1.9 \pm 0.9) \times 10^{-3}$		1654
$K_1(1270)^\pm K^\mp$	$(1.00\pm 0.28) \times 10^{-3}$		1581
$K_S^0 K_S^0\pi^+\pi^-$	$(2.2 \pm 0.4) \times 10^{-4}$		1724
$\rho^0 p\overline{p}$	$(5.0 \pm 2.2) \times 10^{-5}$		1251
$K^+\overline{K}^*(892)^0\pi^- +$ c.c.	$(6.7 \pm 2.5) \times 10^{-4}$		1674
$2(\pi^+\pi^-)$	$(2.4 \pm 0.6) \times 10^{-4}$	S=2.2	1817
$\rho^0\pi^+\pi^-$	$(2.2 \pm 0.6) \times 10^{-4}$	S=1.4	1750
$K^+K^-\pi^+\pi^-\pi^0$	$(1.26\pm 0.09) \times 10^{-3}$		1694
$\omega f_0(1710) \to \omega K^+K^-$	$(5.9 \pm 2.2) \times 10^{-5}$		–
$K^*(892)^0 K^-\pi^+\pi^0 +$ c.c.	$(8.6 \pm 2.2) \times 10^{-4}$		–
$K^*(892)^+ K^-\pi^+\pi^- +$ c.c.	$(9.6 \pm 2.8) \times 10^{-4}$		–
$K^*(892)^+ K^-\rho^0 +$ c.c.	$(7.3 \pm 2.6) \times 10^{-4}$		–
$K^*(892)^0 K^-\rho^+ +$ c.c.	$(6.1 \pm 1.8) \times 10^{-4}$		–
ηK^+K^-	$< 1.3 \times 10^{-4}$	CL=90%	1664
ωK^+K^-	$(1.85\pm 0.25) \times 10^{-4}$	S=1.1	1614
$3(\pi^+\pi^-)$	$(3.5 \pm 2.0) \times 10^{-4}$	S=2.8	1774
$p\overline{p}\pi^+\pi^-\pi^0$	$(7.3 \pm 0.7) \times 10^{-4}$		1435
K^+K^-	$(6.3 \pm 0.7) \times 10^{-5}$		1776
$K_S^0 K_L^0$	$(5.4 \pm 0.5) \times 10^{-5}$		1775
$\pi^+\pi^-\pi^0$	$(1.68\pm 0.26) \times 10^{-4}$	S=1.4	1830
$\rho(2150)\pi \to \pi^+\pi^-\pi^0$	$(1.9 \,^{+1.2}_{-0.4}) \times 10^{-4}$		–
$\rho(770)\pi \to \pi^+\pi^-\pi^0$	$(3.2 \pm 1.2) \times 10^{-5}$	S=1.8	–
$\pi^+\pi^-$	$(8 \pm 5) \times 10^{-5}$		1838
$K_1(1400)^\pm K^\mp$	$< 3.1 \times 10^{-4}$	CL=90%	1532
$K^+K^-\pi^0$	$< 2.96 \times 10^{-5}$	CL=90%	1754
$K^+\overline{K}^*(892)^- +$ c.c.	$(1.7 \,^{+0.8}_{-0.7}) \times 10^{-5}$		1698
$K^*(892)^0\overline{K}^0 +$ c.c.	$(1.09\pm 0.20) \times 10^{-4}$		1697
$\phi\pi^+\pi^-$	$(1.17\pm 0.29) \times 10^{-4}$	S=1.7	1690
$\phi f_0(980) \to \pi^+\pi^-$	$(6.8 \pm 2.4) \times 10^{-5}$	S=1.1	–
$2(K^+K^-)$	$(6.0 \pm 1.4) \times 10^{-5}$		1499

$\phi K^+ K^-$	(7.0 $\pm$1.6) $\times 10^{-5}$			1546
$2(K^+ K^-)\pi^0$	(1.10$\pm$0.28) $\times 10^{-4}$			1440
$\phi\eta$	(2.8 $^{+1.0}_{-0.8}$) $\times 10^{-5}$			1654
$\phi\eta'$	(3.1 $\pm$1.6) $\times 10^{-5}$			1555
$\omega\eta'$	(3.2 $^{+2.5}_{-2.1}$) $\times 10^{-5}$			1623
$\omega\pi^0$	(2.1 $\pm$0.6) $\times 10^{-5}$			1757
$\rho\eta'$	(1.9 $^{+1.7}_{-1.2}$) $\times 10^{-5}$			1625
$\rho\eta$	(2.2 $\pm$0.6) $\times 10^{-5}$		S=1.1	1717
$\omega\eta$	$<$ 1.1	$\times 10^{-5}$	CL=90%	1715
$\phi\pi^0$	$<$ 4	$\times 10^{-6}$	CL=90%	1699
$\eta_c\pi^+\pi^-\pi^0$	$<$ 1.0	$\times 10^{-3}$	CL=90%	–
$p\overline{p}K^+K^-$	(2.7 $\pm$0.7) $\times 10^{-5}$			1118
$\overline{\Lambda}nK^0_S$ + c.c.	(8.1 $\pm$1.8) $\times 10^{-5}$			1324
$\phi f'_2(1525)$	(4.4 $\pm$1.6) $\times 10^{-5}$			1321
$\Theta(1540)\overline{\Theta}(1540) \rightarrow K^0_S pK^-\overline{n}$ + c.c.	$<$ 8.8	$\times 10^{-6}$	CL=90%	–
$\Theta(1540)K^-\overline{n} \rightarrow K^0_S pK^-\overline{n}$	$<$ 1.0	$\times 10^{-5}$	CL=90%	–
$\Theta(1540)K^0_S\overline{p} \rightarrow K^0_S\overline{p}K^+n$	$<$ 7.0	$\times 10^{-6}$	CL=90%	–
$\overline{\Theta}(1540)K^+n \rightarrow K^0_S\overline{p}K^+n$	$<$ 2.6	$\times 10^{-5}$	CL=90%	–
$\overline{\Theta}(1540)K^0_S p \rightarrow K^0_S pK^-\overline{n}$	$<$ 6.0	$\times 10^{-6}$	CL=90%	–
$K^0_S K^0_S$	$<$ 4.6	$\times 10^{-6}$		1775

Radiative decays

$\gamma\chi_{c0}(1P)$	(9.42$\pm$0.31) %			261
$\gamma\chi_{c1}(1P)$	(9.2 $\pm$0.4) %			171
$\gamma\chi_{c2}(1P)$	(8.69$\pm$0.35) %			128
$\pi^0 h_c \rightarrow \gamma\eta_c(1S)\pi^0$	(4.2 $\pm$0.5) $\times 10^{-4}$			–
$\gamma\eta_c(1S)$	(3.4 $\pm$0.5) $\times 10^{-3}$		S=1.3	638
$\gamma\eta_c(2S)$	$<$ 2.0	$\times 10^{-3}$	CL=90%	48
$\gamma\pi^0$	$<$ 5.4	$\times 10^{-3}$	CL=95%	1841
$\gamma\eta'(958)$	(1.36$\pm$0.24) $\times 10^{-4}$			1719
$\gamma f_2(1270)$	(2.1 $\pm$0.4) $\times 10^{-4}$			1622
$\gamma f_0(1710) \rightarrow \gamma\pi\pi$	(3.0 $\pm$1.3) $\times 10^{-5}$			–
$\gamma f_0(1710) \rightarrow \gamma K\overline{K}$	(6.0 $\pm$1.6) $\times 10^{-5}$			–
$\gamma\gamma$	$<$ 1.4	$\times 10^{-4}$	CL=90%	1843
$\gamma\eta$	$<$ 9	$\times 10^{-5}$	CL=90%	1802
$\gamma\eta\pi^+\pi^-$	(8.7 $\pm$2.1) $\times 10^{-4}$			1791
$\gamma\eta(1405) \rightarrow \gamma K\overline{K}\pi$	$<$ 9	$\times 10^{-5}$	CL=90%	1569
$\gamma\eta(1405) \rightarrow \eta\pi^+\pi^-$	(3.6 $\pm$2.5) $\times 10^{-5}$			–
$\gamma\eta(1475) \rightarrow K\overline{K}\pi$	$<$ 1.4	$\times 10^{-4}$	CL=90%	–
$\gamma\eta(1475) \rightarrow \eta\pi^+\pi^-$	$<$ 8.8	$\times 10^{-5}$	CL=90%	–
$\gamma 2(\pi^+\pi^-)$	(4.0 $\pm$0.6) $\times 10^{-4}$			1817

$\gamma K^{*0} K^+ \pi^-$ + 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
$\gamma p \overline{p}$	(2.9 ±0.6)	$\times 10^{-5}$		1586
$\gamma \pi^+ \pi^- p \overline{p}$	(2.8 ±1.4)	$\times 10^{-5}$		1491
$\gamma 2(\pi^+ \pi^-) K^+ K^-$	< 2.2	$\times 10^{-4}$	CL=90%	1654
$\gamma 3(\pi^+ \pi^-)$	< 1.7	$\times 10^{-4}$	CL=90%	1774
$\gamma K^+ K^- K^+ K^-$	< 4	$\times 10^{-5}$	CL=90%	1499

$\psi(3770)$

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

Mass $m = 3772.92 \pm 0.35$ MeV (S = 1.1)
Full width $\Gamma = 27.3 \pm 1.0$ MeV
$\Gamma_{ee} = 0.265 \pm 0.018$ keV (S = 1.3)

In addition to the dominant decay mode to $D\overline{D}$, $\psi(3770)$ was found to decay into the final states containing the J/ψ (BAI 05, ADAM 06). ADAMS 06 and HUANG 06A searched for various decay modes with light hadrons and found a statistically significant signal for the decay to $\phi\eta$ only (ADAMS 06).

$\psi(3770)$ DECAY MODES	Fraction (Γ_i/Γ)	Scale factor/ Confidence level	p (MeV/c)
$D\overline{D}$	(85.3 ±3.2) %		285
$D^0\overline{D}^0$	(48.7 ±3.2) %		285
D^+D^-	(36.1 ±2.8) %		251
$J/\psi\pi^+\pi^-$	(1.93±0.28) $\times 10^{-3}$		560
$J/\psi\pi^0\pi^0$	(8.0 ±3.0) $\times 10^{-4}$		564
$J/\psi\eta$	(9 ±4) $\times 10^{-4}$		359
$J/\psi\pi^0$	< 2.8 $\times 10^{-4}$	CL=90%	603
$\gamma\chi_{c0}$	(7.3 ±0.9) $\times 10^{-3}$		–
$\gamma\chi_{c1}$	(2.9 ±0.6) $\times 10^{-3}$		–
$\gamma\chi_{c2}$	< 9 $\times 10^{-4}$	CL=90%	–
e^+e^-	(9.7 ±0.7) $\times 10^{-6}$	S=1.2	1886
$K^0_S K^0_L$	< 1.2 $\times 10^{-5}$	CL=90%	1820
$2(\pi^+\pi^-)$	< 1.12 $\times 10^{-3}$	CL=90%	1861
$2(\pi^+\pi^-)\pi^0$	< 1.06 $\times 10^{-3}$	CL=90%	1843
$2(\pi^+\pi^-\pi^0)$	< 5.85 %	CL=90%	1821
$\omega\pi^+\pi^-$	< 6.0 $\times 10^{-4}$	CL=90%	1794
$3(\pi^+\pi^-)$	< 9.1 $\times 10^{-3}$		1819
$3(\pi^+\pi^-)\pi^0$	< 1.37 %		1792
$3(\pi^+\pi^-)2\pi^0$	< 11.74 %	CL=90%	1759
$\eta\pi^+\pi^-$	< 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	%		1804
$\eta' 3\pi$	$<$	2.44	$\times 10^{-3}$	CL=90%	1740
$K^+K^-\pi^+\pi^-$	$<$	9.0	$\times 10^{-4}$	CL=90%	1772
$\phi\pi^+\pi^-$	$<$	4.1	$\times 10^{-4}$	CL=90%	1737
$K^+K^-2\pi^0$	$<$	4.2	$\times 10^{-3}$	CL=90%	1774
$\phi\pi^0$	not seen				1746
$\phi\eta$	(3.1	± 0.7)	$\times 10^{-4}$		1703
$4(\pi^+\pi^-)$	$<$	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%	1600
$K^+K^-\pi^+\pi^-\pi^0$	$<$	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%	1622
ωK^+K^-	$<$	3.4	$\times 10^{-4}$	CL=90%	1664
$\phi\pi^+\pi^-\pi^0$	$<$	3.8	$\times 10^{-3}$	CL=90%	1722
$K^{*0}K^-\pi^+\pi^0 +$ c.c.	$<$	1.62	%	CL=90%	1693
$K^{*+}K^-\pi^+\pi^- +$ c.c.	$<$	3.23	%	CL=90%	1692
$K^+K^-\pi^+\pi^-2\pi^0$	$<$	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%	1660
ηK^+K^-	$<$	4.1	$\times 10^{-4}$	CL=90%	1711
$\rho^0 K^+K^-$	$<$	5.0	$\times 10^{-3}$	CL=90%	1665
$2(K^+K^-)$	$<$	6.0	$\times 10^{-4}$	CL=90%	1551
ϕK^+K^-	$<$	7.5	$\times 10^{-4}$	CL=90%	1597
$2(K^+K^-)\pi^0$	$<$	2.9	$\times 10^{-4}$	CL=90%	1493
$2(K^+K^-)\pi^+\pi^-$	$<$	3.2	$\times 10^{-3}$	CL=90%	1425
$K^0_S K^-\pi^+$	$<$	3.2	$\times 10^{-3}$	CL=90%	1799
$K^0_S K^-\pi^+\pi^0$	$<$	1.33	%	CL=90%	1773
$K^0_S K^-2\pi^+\pi^-$	$<$	8.7	$\times 10^{-3}$	CL=90%	1739
$K^0_S K^-2\pi^+\pi^-\pi^0$	$<$	4.18	%	CL=90%	1703
$K^0_S K^-\pi^+2(\pi^+\pi^-)$	$<$	1.22	%	CL=90%	1658
$K^0_S K^-\pi^+2\pi^0$	$<$	2.65	%	CL=90%	1741
$K^{*0}K^-\pi^+ +$ c.c.	$<$	9.7	$\times 10^{-3}$	CL=90%	1721
$p\overline{p}\pi^0$	$<$	1.2	$\times 10^{-3}$		1595
$p\overline{p}\pi^+\pi^-$	$<$	5.8	$\times 10^{-4}$	CL=90%	1544
$\Lambda\overline{\Lambda}$	$<$	1.2	$\times 10^{-4}$	CL=90%	1521
$p\overline{p}\pi^+\pi^-\pi^0$	$<$	1.85	$\times 10^{-3}$	CL=90%	1490
$\omega p\overline{p}$	$<$	2.9	$\times 10^{-4}$	CL=90%	1309
$\Lambda\overline{\Lambda}\pi^0$	$<$	1.2	$\times 10^{-3}$	CL=90%	1468
$p\overline{p}2(\pi^+\pi^-)$	$<$	2.6	$\times 10^{-3}$	CL=90%	1425
$\eta p\overline{p}$	$<$	5.4	$\times 10^{-4}$	CL=90%	1430
$\rho^0 p\overline{p}$	$<$	1.7	$\times 10^{-3}$	CL=90%	1313

$p\overline{p}K^+K^-$	$<$ 3.2	$\times 10^{-4}$	CL=90%	1185
$\phi p\overline{p}$	$<$ 1.3	$\times 10^{-4}$	CL=90%	1178
$\Lambda\overline{\Lambda}\pi^+\pi^-$	$<$ 2.5	$\times 10^{-4}$	CL=90%	1404
$\Lambda\overline{p}K^+$	$<$ 2.8	$\times 10^{-4}$	CL=90%	1387
$\Lambda\overline{p}K^+\pi^+\pi^-$	$<$ 6.3	$\times 10^{-4}$	CL=90%	1234
$\pi^+\pi^-\pi^0$	not seen			1874
$\rho\pi$	not seen			1804
$\omega\pi^0$	not seen			1803
$\rho\eta$	not seen			1763
$\omega\eta$	not seen			1762
$\rho\eta'$	not seen			1674
$\omega\eta'$	not seen			1672
$\phi\eta'$	not seen			1606
$K^{*0}\overline{K}^0$	not seen			1744
$K^{*+}K^-$	not seen			1745
$b_1\pi$	not seen			1683

X(3872)

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

Quantum numbers not established.

Mass $m = 3872.3 \pm 0.8$ MeV (S = 2.3)
$m_{X(3872)} - m_{J/\psi} = 775 \pm 4$ MeV
$m_{X(3872)} - m_{\psi(2S)}$
Full width $\Gamma = 3.0^{+2.1}_{-1.7}$ MeV

X(3872) DECAY MODES	Fraction (Γ_i/Γ)	Confidence level	p (MeV/c)
e^+e^-	$<8 \times 10^{-5}$	90%	1936
$\pi^+\pi^- J/\psi(1S)$	>2.6 %	90%	650
$\rho^0 J/\psi(1S)$	seen		†
$D^0\overline{D}^0$	not seen		521
D^+D^-	not seen		503
$D^0\overline{D}^0\pi^0$	seen		122

X(3945)

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

Observed in $\omega J/\psi$, thus $C = +$

Mass $m = 3916 \pm 6$ MeV (S = 1.6)
Full width $\Gamma = 40^{+18}_{-13}$ MeV (S = 1.5)

***X*(3945) DECAY MODES**	Fraction (Γ_i/Γ)	p (MeV/c)
$\omega J/\psi$	seen	216

$\psi(4040)$ [d]

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

Mass $m = 4039 \pm 1$ MeV
Full width $\Gamma = 80 \pm 10$ MeV
$\Gamma_{ee} = 0.86 \pm 0.07$ keV

ψ**(4040) DECAY MODES**	Fraction (Γ_i/Γ)	Confidence level	p (MeV/c)
$e^+ e^-$	$(1.07 \pm 0.16) \times 10^{-5}$		2019
$D^0 \overline{D}^0$	seen		775
$D^*(2007)^0 \overline{D}^0 +$ c.c.	seen		575
$D^*(2007)^0 \overline{D}^*(2007)^0$	seen		225
$J/\psi \pi^+ \pi^-$	$< 4 \times 10^{-3}$	90%	794
$J/\psi \pi^0 \pi^0$	$< 2 \times 10^{-3}$	90%	797
$J/\psi \eta$	$< 7 \times 10^{-3}$	90%	675
$J/\psi \pi^0$	$< 2 \times 10^{-3}$	90%	823
$J/\psi \pi^+ \pi^- \pi^0$	$< 2 \times 10^{-3}$	90%	746
$\chi_{c1} \gamma$	< 1.1 %	90%	494
$\chi_{c2} \gamma$	< 1.7 %	90%	454
$\chi_{c1} \pi^+ \pi^- \pi^0$	< 1.1 %	90%	306
$\chi_{c2} \pi^+ \pi^- \pi^0$	< 3.2 %	90%	233
$\phi \pi^+ \pi^-$	$< 3 \times 10^{-3}$	90%	1880

$\psi(4160)$ [d]

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

Mass $m = 4153 \pm 3$ MeV
Full width $\Gamma = 103 \pm 8$ MeV
$\Gamma_{ee} = 0.83 \pm 0.07$ keV

$\psi(4160)$ DECAY MODES	Fraction (Γ_i/Γ)	Confidence level	p (MeV/c)
e^+e^-	$(8.1\pm0.9)\times10^{-6}$		2076
$J/\psi\pi^+\pi^-$	< 3 $\times10^{-3}$	90%	888
$J/\psi\pi^0\pi^0$	< 3 $\times10^{-3}$	90%	891
$J/\psi K^+K^-$	< 2 $\times10^{-3}$	90%	324
$J/\psi\eta$	< 8 $\times10^{-3}$	90%	786
$J/\psi\pi^0$	< 1 $\times10^{-3}$	90%	914
$J/\psi\eta'$	< 5 $\times10^{-3}$	90%	385
$J/\psi\pi^+\pi^-\pi^0$	< 1 $\times10^{-3}$	90%	847
$\psi(2S)\pi^+\pi^-$	< 4 $\times10^{-3}$	90%	353
$\chi_{c1}\gamma$	< 7 $\times10^{-3}$	90%	593
$\chi_{c2}\gamma$	< 1.3 %	90%	554
$\chi_{c1}\pi^+\pi^-\pi^0$	< 2 $\times10^{-3}$	90%	452
$\chi_{c2}\pi^+\pi^-\pi^0$	< 8 $\times10^{-3}$	90%	398
$\phi\pi^+\pi^-$	< 2 $\times10^{-3}$	90%	1941

$X(4260)$

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

Mass $m = 4263^{+8}_{-9}$ MeV (S = 1.1)
Full width $\Gamma = 95 \pm 14$ MeV

$X(4260)$ DECAY MODES	Fraction (Γ_i/Γ)	p (MeV/c)
$J/\psi\pi^+\pi^-$	seen	976
$J/\psi\pi^0\pi^0$	[e] seen	978
$J/\psi K^+K^-$	[e] seen	530
$J/\psi\eta$	[e] not seen	886
$J/\psi\pi^0$	[e] not seen	999
$J/\psi\eta'$	[e] not seen	569
$J/\psi\pi^+\pi^-\pi^0$	[e] not seen	939
$J/\psi\eta\eta$	[e] not seen	339
$\psi(2S)\pi^+\pi^-$	[e] not seen	470
$\psi(2S)\eta$	[e] not seen	167
$\chi_{c0}\omega$	[e] not seen	284
$\chi_{c1}\gamma$	[e] not seen	686
$\chi_{c2}\gamma$	[e] not seen	648
$\chi_{c1}\pi^+\pi^-\pi^0$	[e] not seen	571
$\chi_{c2}\pi^+\pi^-\pi^0$	[e] not seen	524
$\phi\pi^+\pi^-$	[e] not seen	1999
$D\overline{D}$	not seen	1032

$\psi(4415)$ [d]

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

Mass $m = 4421 \pm 4$ MeV
Full width $\Gamma = 62 \pm 20$ MeV
$\Gamma_{ee} = 0.58 \pm 0.07$ keV

$\psi(4415)$ DECAY MODES	Fraction (Γ_i/Γ)	Confidence level	p (MeV/c)
hadrons	dominant		–
$(D^0 D^- \pi^+)_{non-res}$	< 2.3 %	90%	–
$D\overline{D}_2^*(2460) \rightarrow D^0 D^- \pi^+$	(10 $\pm$4) %		–
$e^+ e^-$	(9.4$\pm$3.2) $\times 10^{-6}$		2210

NOTES

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

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

[c] See the "Note on the $\eta(1405)$" in the $\eta(1405)$ Particle Listings.

[d] 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.

[e] See COAN 06 for details.