$c\overline{c}$ MESONS

$\eta_c(1S)$

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

Mass $m = 2979.8 \pm 2.1$ MeV (S = 2.1)
Full width $\Gamma = 13.2^{+3.8}_{-3.2}$ MeV

$\eta_c(1S)$ DECAY MODES	Fraction (Γ_i/Γ)	Confidence level	p (MeV/c)
Decays involving hadronic resonances			
$\eta'(958)\pi\pi$	(4.1 ± 1.7) %		1319
$\rho\rho$	(2.6 ± 0.9) %		1275
$K^*(892)^0 K^- \pi^+ +$ c.c.	(2.0 ± 0.7) %		1273
$K^*(892)\overline{K}^*(892)$	$(8.5 \pm 3.1) \times 10^{-3}$		1193
$\phi\phi$	$(7.1 \pm 2.8) \times 10^{-3}$		1086
$a_0(980)\pi$	< 2 %	90%	1323
$a_2(1320)\pi$	< 2 %	90%	1193
$K^*(892)\overline{K} +$ c.c.	< 1.28 %	90%	1307
$f_2(1270)\eta$	< 1.1 %	90%	1142
$\omega\omega$	$< 3.1 \times 10^{-3}$	90%	1268
Decays into stable hadrons			
$K\overline{K}\pi$	(5.5 ± 1.7) %		1378
$\eta\pi\pi$	(4.9 ± 1.8) %		1425
$\pi^+\pi^- K^+ K^-$	$(2.0 ^{+0.7}_{-0.6})$ %		1342
$2(K^+ K^-)$	(2.1 ± 1.2) %		1053
$2(\pi^+\pi^-)$	(1.2 ± 0.4) %		1457
$p\overline{p}$	$(1.2 \pm 0.4) \times 10^{-3}$		1157
$K\overline{K}\eta$	< 3.1 %	90%	1262
$\pi^+\pi^- p\overline{p}$	< 1.2 %	90%	1023
$\Lambda\overline{\Lambda}$	$< 2 \times 10^{-3}$	90%	987
Radiative decays			
$\gamma\gamma$	$(3.0 \pm 1.2) \times 10^{-4}$		1489

$J/\psi(1S)$

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

Mass $m = 3096.88 \pm 0.04$ MeV
Full width $\Gamma = 87 \pm 5$ keV
$\Gamma_{ee} = 5.26 \pm 0.37$ keV (Assuming $\Gamma_{ee} = \Gamma_{\mu\mu}$)

$J/\psi(1S)$ DECAY MODES		Fraction (Γ_i/Γ)	Scale factor/ Confidence level	p (MeV/c)
hadrons		(87.7 ± 0.5) %		–
virtual$\gamma \to$ hadrons		(17.0 ± 2.0) %		–
e^+e^-		(6.02 ± 0.19) %		1548
$\mu^+\mu^-$		(6.01 ± 0.19) %		1545
Decays involving hadronic resonances				
$\rho\pi$		(1.27 ± 0.09) %		1449
$\rho^0\pi^0$		$(4.2 \pm 0.5) \times 10^{-3}$		1449
$a_2(1320)\rho$		(1.09 ± 0.22) %		1125
$\omega\pi^+\pi^+\pi^-\pi^-$		$(8.5 \pm 3.4) \times 10^{-3}$		1392
$\omega\pi^+\pi^-$		$(7.2 \pm 1.0) \times 10^{-3}$		1435
$\omega f_2(1270)$		$(4.3 \pm 0.6) \times 10^{-3}$		1143
$K^*(892)^0\overline{K}^*_2(1430)^0 +$ c.c.		$(6.7 \pm 2.6) \times 10^{-3}$		1005
$\omega K^*(892)\overline{K} +$ c.c.		$(5.3 \pm 2.0) \times 10^{-3}$		1098
$K^+\overline{K}^*(892)^- +$ c.c.		$(5.0 \pm 0.4) \times 10^{-3}$		1373
$K^0\overline{K}^*(892)^0 +$ c.c.		$(4.2 \pm 0.4) \times 10^{-3}$		1371
$\omega\pi^0\pi^0$		$(3.4 \pm 0.8) \times 10^{-3}$		1436
$b_1(1235)^{\pm}\pi^{\mp}$	[gg]	$(3.0 \pm 0.5) \times 10^{-3}$		1299
$\omega K^{\pm}K^0_S\pi^{\mp}$	[gg]	$(3.0 \pm 0.7) \times 10^{-3}$		1210
$b_1(1235)^0\pi^0$		$(2.3 \pm 0.6) \times 10^{-3}$		1299
$\phi K^*(892)\overline{K} +$ c.c.		$(2.04 \pm 0.28) \times 10^{-3}$		969
$\omega K\overline{K}$		$(1.9 \pm 0.4) \times 10^{-3}$		1268
$\omega f_J(1710) \to \omega K\overline{K}$		$(4.8 \pm 1.1) \times 10^{-4}$		878
$\phi 2(\pi^+\pi^-)$		$(1.60 \pm 0.32) \times 10^{-3}$		1318
$\Delta(1232)^{++}\overline{p}\pi^-$		$(1.6 \pm 0.5) \times 10^{-3}$		1030
$\omega\eta$		$(1.58 \pm 0.16) \times 10^{-3}$		1394
$\phi K\overline{K}$		$(1.48 \pm 0.22) \times 10^{-3}$		1179
$\phi f_J(1710) \to \phi K\overline{K}$		$(3.6 \pm 0.6) \times 10^{-4}$		875
$p\overline{p}\omega$		$(1.30 \pm 0.25) \times 10^{-3}$	S=1.3	769
$\Delta(1232)^{++}\overline{\Delta}(1232)^{--}$		$(1.10 \pm 0.29) \times 10^{-3}$		938
$\Sigma(1385)^-\overline{\Sigma}(1385)^+$ (or c.c.)	[gg]	$(1.03 \pm 0.13) \times 10^{-3}$		692
$p\overline{p}\eta'(958)$		$(9 \pm 4) \times 10^{-4}$	S=1.7	596
$\phi f'_2(1525)$		$(8 \pm 4) \times 10^{-4}$	S=2.7	871
$\phi\pi^+\pi^-$		$(8.0 \pm 1.2) \times 10^{-4}$		1365

$\phi K^{\pm} K^0_S \pi^{\mp}$	[gg]	$(7.2 \pm 0.9) \times 10^{-4}$		1114
$\omega f_1(1420)$		$(6.8 \pm 2.4) \times 10^{-4}$		1062
$\phi \eta$		$(6.5 \pm 0.7) \times 10^{-4}$		1320
$\Xi(1530)^- \overline{\Xi}^+$		$(5.9 \pm 1.5) \times 10^{-4}$		597
$p K^- \overline{\Sigma}(1385)^0$		$(5.1 \pm 3.2) \times 10^{-4}$		645
$\omega \pi^0$		$(4.2 \pm 0.6) \times 10^{-4}$	S=1.4	1447
$\phi \eta'(958)$		$(3.3 \pm 0.4) \times 10^{-4}$		1192
$\phi f_0(980)$		$(3.2 \pm 0.9) \times 10^{-4}$	S=1.9	1182
$\Xi(1530)^0 \overline{\Xi}^0$		$(3.2 \pm 1.4) \times 10^{-4}$		608
$\Sigma(1385)^- \overline{\Sigma}^+$ (or c.c.)	[gg]	$(3.1 \pm 0.5) \times 10^{-4}$		857
$\phi f_1(1285)$		$(2.6 \pm 0.5) \times 10^{-4}$	S=1.1	1032
$\rho \eta$		$(1.93 \pm 0.23) \times 10^{-4}$		1398
$\omega \eta'(958)$		$(1.67 \pm 0.25) \times 10^{-4}$		1279
$\omega f_0(980)$		$(1.4 \pm 0.5) \times 10^{-4}$		1271
$\rho \eta'(958)$		$(1.05 \pm 0.18) \times 10^{-4}$		1283
$p \overline{p} \phi$		$(4.5 \pm 1.5) \times 10^{-5}$		527
$a_2(1320)^{\pm} \pi^{\mp}$	[gg]	$< 4.3 \times 10^{-3}$	CL=90%	1263
$K \overline{K}{}^*_2(1430)+$ c.c.		$< 4.0 \times 10^{-3}$	CL=90%	1159
$K^*_2(1430)^0 \overline{K}{}^*_2(1430)^0$		$< 2.9 \times 10^{-3}$	CL=90%	588
$K^*(892)^0 \overline{K}{}^*(892)^0$		$< 5 \times 10^{-4}$	CL=90%	1263
$\phi f_2(1270)$		$< 3.7 \times 10^{-4}$	CL=90%	1036
$p \overline{p} \rho$		$< 3.1 \times 10^{-4}$	CL=90%	779
$\phi \eta(1440) \rightarrow \phi \eta \pi \pi$		$< 2.5 \times 10^{-4}$	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%	911
$\Delta(1232)^+ \overline{p}$		$< 1 \times 10^{-4}$	CL=90%	1100
$\Sigma^0 \overline{\Lambda}$		$< 9 \times 10^{-5}$	CL=90%	1032
$\phi \pi^0$		$< 6.8 \times 10^{-6}$	CL=90%	1377

Decays into stable hadrons

$2(\pi^+ \pi^-) \pi^0$		(3.37 ± 0.26) %		1496
$3(\pi^+ \pi^-) \pi^0$		(2.9 ± 0.6) %		1433
$\pi^+ \pi^- \pi^0$		(1.50 ± 0.20) %		1533
$\pi^+ \pi^- \pi^0 K^+ K^-$		(1.20 ± 0.30) %		1368
$4(\pi^+ \pi^-) \pi^0$		$(9.0 \pm 3.0) \times 10^{-3}$		1345
$\pi^+ \pi^- K^+ K^-$		$(7.2 \pm 2.3) \times 10^{-3}$		1407
$K \overline{K} \pi$		$(6.1 \pm 1.0) \times 10^{-3}$		1440
$p \overline{p} \pi^+ \pi^-$		$(6.0 \pm 0.5) \times 10^{-3}$	S=1.3	1107
$2(\pi^+ \pi^-)$		$(4.0 \pm 1.0) \times 10^{-3}$		1517
$3(\pi^+ \pi^-)$		$(4.0 \pm 2.0) \times 10^{-3}$		1466
$n \overline{n} \pi^+ \pi^-$		$(4 \pm 4) \times 10^{-3}$		1106
$\Sigma^0 \overline{\Sigma}^0$		$(1.27 \pm 0.17) \times 10^{-3}$		992
$2(\pi^+ \pi^-) K^+ K^-$		$(3.1 \pm 1.3) \times 10^{-3}$		1320
$p \overline{p} \pi^+ \pi^- \pi^0$	[hhh]	$(2.3 \pm 0.9) \times 10^{-3}$	S=1.9	1033

$p\overline{p}$		$(2.14\pm0.10)\times10^{-3}$		1232
$p\overline{p}\eta$		$(2.09\pm0.18)\times10^{-3}$		948
$p\overline{n}\pi^-$		$(2.00\pm0.10)\times10^{-3}$		1174
$n\overline{n}$		$(1.9\ \pm0.5\ )\times10^{-3}$		1231
$\Xi\overline{\Xi}$		$(1.8\ \pm0.4\ )\times10^{-3}$	S=1.8	818
$\Lambda\overline{\Lambda}$		$(1.35\pm0.14)\times10^{-3}$	S=1.2	1074
$p\overline{p}\pi^0$		$(1.09\pm0.09)\times10^{-3}$		1176
$\Lambda\overline{\Sigma}^-\pi^+$ (or c.c.)	[gg]	$(1.06\pm0.12)\times10^{-3}$		945
$pK^-\overline{\Lambda}$		$(8.9\ \pm1.6\ )\times10^{-4}$		876
$2(K^+K^-)$		$(7.0\ \pm3.0\ )\times10^{-4}$		1131
$pK^-\overline{\Sigma}^0$		$(2.9\ \pm0.8\ )\times10^{-4}$		820
K^+K^-		$(2.37\pm0.31)\times10^{-4}$		1468
$\Lambda\overline{\Lambda}\pi^0$		$(2.2\ \pm0.7\ )\times10^{-4}$		998
$\pi^+\pi^-$		$(1.47\pm0.23)\times10^{-4}$		1542
$K^0_S K^0_L$		$(1.08\pm0.14)\times10^{-4}$		1466
$\Lambda\overline{\Sigma}$ + c.c.		$<1.5\times10^{-4}$	CL=90%	1032
$K^0_S K^0_S$		$<5.2\times10^{-6}$	CL=90%	1466

Radiative decays

$\gamma\eta_c(1S)$		$(1.3\ \pm0.4\ )$ %		116
$\gamma\pi^+\pi^-2\pi^0$		$(8.3\ \pm3.1\ )\times10^{-3}$		1518
$\gamma\eta\pi\pi$		$(6.1\ \pm1.0\ )\times10^{-3}$		1487
$\gamma\eta(1440)\rightarrow\gamma K\overline{K}\pi$	[p]	$(9.1\ \pm1.8\ )\times10^{-4}$		1223
$\gamma\eta(1440)\rightarrow\gamma\gamma\rho^0$		$(6.4\ \pm1.4\ )\times10^{-5}$		1223
$\gamma\eta(1440)\rightarrow\gamma\eta\pi^+\pi^-$		$(3.4\ \pm0.7\ )\times10^{-4}$		–
$\gamma\rho\rho$		$(4.5\ \pm0.8\ )\times10^{-3}$		1343
$\gamma\eta'(958)$		$(4.31\pm0.30)\times10^{-3}$		1400
$\gamma2\pi^+2\pi^-$		$(2.8\ \pm0.5\ )\times10^{-3}$	S=1.9	1517
$\gamma f_4(2050)$		$(2.7\ \pm0.7\ )\times10^{-3}$		874
$\gamma\omega\omega$		$(1.59\pm0.33)\times10^{-3}$		1337
$\gamma\eta(1440)\rightarrow\gamma\rho^0\rho^0$		$(1.7\ \pm0.4\ )\times10^{-3}$	S=1.3	1223
$\gamma f_2(1270)$		$(1.38\pm0.14)\times10^{-3}$		1286
$\gamma f_J(1710)\rightarrow\gamma K\overline{K}$		$(8.5\ ^{+1.2}_{-0.9})\times10^{-4}$	S=1.2	1075
$\gamma\eta$		$(8.6\ \pm0.8\ )\times10^{-4}$		1500
$\gamma f_1(1420)\rightarrow\gamma K\overline{K}\pi$		$(8.3\ \pm1.5\ )\times10^{-4}$		1220
$\gamma f_1(1285)$		$(6.5\ \pm1.0\ )\times10^{-4}$		1283
$\gamma f'_2(1525)$		$(4.7\ ^{+0.7}_{-0.5})\times10^{-4}$		1173
$\gamma\phi\phi$		$(4.0\ \pm1.2\ )\times10^{-4}$	S=2.1	1166
$\gamma p\overline{p}$		$(3.8\ \pm1.0\ )\times10^{-4}$		1232
$\gamma\eta(2225)$		$(2.9\ \pm0.6\ )\times10^{-4}$		834

$\gamma\,\eta(1760) \rightarrow \gamma\,\rho^0\,\rho^0$	$(1.3 \pm 0.9) \times 10^{-4}$		1048
$\gamma\,\pi^0$	$(3.9 \pm 1.3) \times 10^{-5}$		1546
$\gamma\,p\,\overline{p}\,\pi^+\,\pi^-$	$< 7.9 \times 10^{-4}$	CL=90%	1107
$\gamma\,\gamma$	$< 5 \times 10^{-4}$	CL=90%	1548
$\gamma\,\Lambda\overline{\Lambda}$	$< 1.3 \times 10^{-4}$	CL=90%	1074
3γ	$< 5.5 \times 10^{-5}$	CL=90%	1548
$\gamma\,f_J(2220)$	$> 2.50 \times 10^{-3}$	CL=99.9%	–
$\gamma\,f_0(1500)$	$(5.7 \pm 0.8) \times 10^{-4}$		1184
$\gamma\,e^+\,e^-$	$(8.8 \pm 1.4) \times 10^{-3}$		–

$\chi_{c0}(1P)$

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

Mass $m = 3417.3 \pm 2.8$ MeV
Full width $\Gamma = 14 \pm 5$ MeV

$\chi_{c0}(1P)$ DECAY MODES	Fraction (Γ_i/Γ)	Confidence level	p (MeV/c)
Hadronic decays			
$2(\pi^+\,\pi^-)$	(3.7 ± 0.7) %		1679
$\pi^+\,\pi^-\,K^+\,K^-$	(3.0 ± 0.7) %		1580
$\rho^0\,\pi^+\,\pi^-$	(1.6 ± 0.5) %		1608
$3(\pi^+\,\pi^-)$	(1.5 ± 0.5) %		1633
$K^+\,\overline{K}^*(892)^0\,\pi^- +$ c.c.	(1.2 ± 0.4) %		1522
$\pi^+\,\pi^-$	$(7.5 \pm 2.1) \times 10^{-3}$		1702
$K^+\,K^-$	$(7.1 \pm 2.4) \times 10^{-3}$		1635
$\pi^+\,\pi^-\,p\,\overline{p}$	$(5.0 \pm 2.0) \times 10^{-3}$		1320
$p\,\overline{p}$	$< 9.0 \times 10^{-4}$	90%	1427
Radiative decays			
$\gamma\,J/\psi(1S)$	$(6.6 \pm 1.8) \times 10^{-3}$		303
$\gamma\,\gamma$	$< 5 \times 10^{-4}$	95%	1708

$\chi_{c1}(1P)$

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

Mass $m = 3510.53 \pm 0.12$ MeV
Full width $\Gamma = 0.88 \pm 0.14$ MeV

$\chi_{c1}(1P)$ DECAY MODES	Fraction (Γ_i/Γ)	p (MeV/c)
Hadronic decays		
$3(\pi^+\pi^-)$	(2.2 ± 0.8) %	1683
$2(\pi^+\pi^-)$	(1.6 ± 0.5) %	1727
$\pi^+\pi^- K^+ K^-$	$(9 \pm 4) \times 10^{-3}$	1632
$\rho^0\pi^+\pi^-$	$(3.9 \pm 3.5) \times 10^{-3}$	1659
$K^+\overline{K}^*(892)^0\pi^- +$ c.c.	$(3.2 \pm 2.1) \times 10^{-3}$	1576
$\pi^+\pi^- p\overline{p}$	$(1.4 \pm 0.9) \times 10^{-3}$	1381
$p\overline{p}$	$(8.6 \pm 1.2) \times 10^{-5}$	1483
$\pi^+\pi^- + K^+K^-$	$< 2.1 \times 10^{-3}$	–
Radiative decays		
$\gamma J/\psi(1S)$	(27.3 ± 1.6) %	389

$\chi_{c2}(1P)$

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

Mass $m = 3556.17 \pm 0.13$ MeV
Full width $\Gamma = 2.00 \pm 0.18$ MeV

$\chi_{c2}(1P)$ DECAY MODES	Fraction (Γ_i/Γ)	Confidence level	p (MeV/c)
Hadronic decays			
$2(\pi^+\pi^-)$	(2.2 ± 0.5) %		1751
$\pi^+\pi^- K^+K^-$	(1.9 ± 0.5) %		1656
$3(\pi^+\pi^-)$	(1.2 ± 0.8) %		1707
$\rho^0\pi^+\pi^-$	$(7 \pm 4) \times 10^{-3}$		1683
$K^+\overline{K}^*(892)^0\pi^- +$ c.c.	$(4.8 \pm 2.8) \times 10^{-3}$		1601
$\pi^+\pi^- p\overline{p}$	$(3.3 \pm 1.3) \times 10^{-3}$		1410
$\pi^+\pi^-$	$(1.9 \pm 1.0) \times 10^{-3}$		1773
K^+K^-	$(1.5 \pm 1.1) \times 10^{-3}$		1708
$p\overline{p}$	$(10.0 \pm 1.0) \times 10^{-5}$		1510
$J/\psi(1S)\pi^+\pi^-\pi^0$	< 1.5 %	90%	185
Radiative decays			
$\gamma J/\psi(1S)$	(13.5 ± 1.1) %		430
$\gamma\gamma$	$(1.6 \pm 0.5) \times 10^{-4}$		1778

$\psi(2S)$

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

Mass $m = 3686.00 \pm 0.09$ MeV
Full width $\Gamma = 277 \pm 31$ keV (S = 1.1)
$\Gamma_{ee} = 2.14 \pm 0.21$ keV (Assuming $\Gamma_{ee} = \Gamma_{\mu\mu}$)

$\psi(2S)$ DECAY MODES	Fraction (Γ_i/Γ)	Scale factor/ Confidence level	p (MeV/c)
hadrons	(98.10 ± 0.30) %		–
virtual $\gamma \rightarrow$ hadrons	(2.9 ± 0.4) %		–
$e^+ e^-$	$(8.5 \pm 0.7) \times 10^{-3}$		1843
$\mu^+ \mu^-$	$(7.7 \pm 1.7) \times 10^{-3}$		1840
Decays into $J/\psi(1S)$ and anything			
$J/\psi(1S)$ anything	(54.2 ± 3.0) %		–
$J/\psi(1S)$ neutrals	(22.8 ± 1.7) %		–
$J/\psi(1S)\pi^+\pi^-$	(30.2 ± 1.9) %		477
$J/\psi(1S)\pi^0\pi^0$	(17.9 ± 1.8) %		481
$J/\psi(1S)\eta$	(2.7 ± 0.4) %	S=1.7	200
$J/\psi(1S)\pi^0$	$(9.7 \pm 2.1) \times 10^{-4}$		527
$J/\psi(1S)\mu^+\mu^-$	$(10.0 \pm 3.3) \times 10^{-3}$		–
Hadronic decays			
$3(\pi^+\pi^-)\pi^0$	$(3.5 \pm 1.6) \times 10^{-3}$		1746
$2(\pi^+\pi^-)\pi^0$	$(3.0 \pm 0.8) \times 10^{-3}$		1799
$\pi^+\pi^- K^+ K^-$	$(1.6 \pm 0.4) \times 10^{-3}$		1726
$\pi^+\pi^- p\overline{p}$	$(8.0 \pm 2.0) \times 10^{-4}$		1491
$K^+\overline{K}^*(892)^0\pi^-$ + c.c.	$(6.7 \pm 2.5) \times 10^{-4}$		1673
$2(\pi^+\pi^-)$	$(4.5 \pm 1.0) \times 10^{-4}$		1817
$\rho^0\pi^+\pi^-$	$(4.2 \pm 1.5) \times 10^{-4}$		1751
$\overline{p}p$	$(1.9 \pm 0.5) \times 10^{-4}$		1586
$3(\pi^+\pi^-)$	$(1.5 \pm 1.0) \times 10^{-4}$		1774
$\overline{p}p\pi^0$	$(1.4 \pm 0.5) \times 10^{-4}$		1543
K^+K^-	$(1.0 \pm 0.7) \times 10^{-4}$		1776
$\pi^+\pi^-\pi^0$	$(9 \pm 5) \times 10^{-5}$		1830
$\rho\pi$	$< 8.3 \times 10^{-5}$	CL=90%	1760
$\pi^+\pi^-$	$(8 \pm 5) \times 10^{-5}$		1838
$\Lambda\overline{\Lambda}$	$< 4 \times 10^{-4}$	CL=90%	1467
$\Xi^-\overline{\Xi}^+$	$< 2 \times 10^{-4}$	CL=90%	1285
$K^+K^-\pi^0$	$< 2.96 \times 10^{-5}$	CL=90%	1754
$K^+\overline{K}^*(892)^-$ + c.c.	$< 5.4 \times 10^{-5}$	CL=90%	1698

Radiative decays

$\gamma \chi_{c0}(1P)$	(9.3 ± 0.9) %		261
$\gamma \chi_{c1}(1P)$	(8.7 ± 0.8) %		171
$\gamma \chi_{c2}(1P)$	(7.8 ± 0.8) %		127
$\gamma \eta_c(1S)$	$(2.8 \pm 0.6) \times 10^{-3}$		639
$\gamma \eta'(958)$	$< 1.1 \times 10^{-3}$	CL=90%	1719
$\gamma \gamma$	$< 1.6 \times 10^{-4}$	CL=90%	1843
$\gamma \eta(1440) \rightarrow \gamma K \overline{K} \pi$	$< 1.2 \times 10^{-4}$	CL=90%	1569

ψ(3770)

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

Mass $m = 3769.9 \pm 2.5$ MeV (S = 1.8)
Full width $\Gamma = 23.6 \pm 2.7$ MeV (S = 1.1)
$\Gamma_{ee} = 0.26 \pm 0.04$ keV (S = 1.2)

ψ(3770) DECAY MODES	Fraction (Γ_i/Γ)	Scale factor	p (MeV/c)
$D \overline{D}$	dominant		242
$e^+ e^-$	$(1.12 \pm 0.17) \times 10^{-5}$	1.2	1885

ψ(4040) [iii]

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

Mass $m = 4040 \pm 10$ MeV
Full width $\Gamma = 52 \pm 10$ MeV
$\Gamma_{ee} = 0.75 \pm 0.15$ keV

ψ(4040) DECAY MODES	Fraction (Γ_i/Γ)	p (MeV/c)
$e^+ e^-$	$(1.4 \pm 0.4) \times 10^{-5}$	2020
$D^0 \overline{D}{}^0$	seen	777
$D^*(2007)^0 \overline{D}{}^0$ + c.c.	seen	578
$D^*(2007)^0 \overline{D}{}^*(2007)^0$	seen	232

ψ(4160) [iii]

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

Mass $m = 4159 \pm 20$ MeV
Full width $\Gamma = 78 \pm 20$ MeV
$\Gamma_{ee} = 0.77 \pm 0.23$ keV

ψ(4160) DECAY MODES	Fraction (Γ_i/Γ)	p (MeV/c)
$e^+ e^-$	$(10 \pm 4) \times 10^{-6}$	2079

$\psi(4415)$ [iii]

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

Mass $m = 4415 \pm 6$ MeV
Full width $\Gamma = 43 \pm 15$ MeV (S = 1.8)
$\Gamma_{ee} = 0.47 \pm 0.10$ keV

$\psi(4415)$ DECAY MODES	Fraction (Γ_i/Γ)	p (MeV/c)
hadrons	dominant	–
e^+e^-	$(1.1\pm0.4) \times 10^{-5}$	2207