$c\overline{c}$ 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 $\gamma \rightarrow$ hadrons		(17.0 ±2.0) %		–
$e^+ e^-$		(6.02±0.19) %		1548
$\mu^+ \mu^-$		(6.01±0.19) %		1545
Decays involving hadronic resonances				
$\rho\pi$		(1.28±0.10) %		1449
$\rho^0 \pi^0$		(4.2 ±0.5) $\times 10^{-3}$		1449
$a_2(1320)\rho$		(1.09±0.22) %		1125
$\omega \pi^+ \pi^+ \pi^- \pi^-$		(8.5 ±3.4) $\times 10^{-3}$		1392
$\omega \pi^+ \pi^-$		(7.2 ±1.0) $\times 10^{-3}$		1435
$K^*(892)^0 \overline{K}{}^*_2(1430)^0 +$ c.c.		(6.7 ±2.6) $\times 10^{-3}$		1005
$\omega K^*(892)\overline{K} +$ c.c.		(5.3 ±2.0) $\times 10^{-3}$		1098
$\omega f_2(1270)$		(4.3 ±0.6) $\times 10^{-3}$		1143
$K^+ \overline{K}{}^*(892)^- +$ c.c.		(5.0 ±0.4) $\times 10^{-3}$		1373
$K^0 \overline{K}{}^*(892)^0 +$ c.c.		(4.2 ±0.4) $\times 10^{-3}$		1371
$\omega \pi^0 \pi^0$		(3.4 ±0.8) $\times 10^{-3}$		1436
$b_1(1235)^\pm \pi^\mp$	[gg]	(3.0 ±0.5) $\times 10^{-3}$		1299
$\omega K^\pm K^0_S \pi^\mp$	[gg]	(3.0 ±0.7) $\times 10^{-3}$		1210
$b_1(1235)^0 \pi^0$		(2.3 ±0.6) $\times 10^{-3}$		1299
$\phi K^*(892)\overline{K} +$ c.c.		(2.04±0.28) $\times 10^{-3}$		969
$\omega K \overline{K}$		(1.9 ±0.4) $\times 10^{-3}$		1268
$\omega f_J(1710) \rightarrow \omega K \overline{K}$		(4.8 ±1.1) $\times 10^{-4}$		878
$\phi 2(\pi^+ \pi^-)$		(1.60±0.32) $\times 10^{-3}$		1318
$\Delta(1232)^{++} \overline{p} \pi^-$		(1.6 ±0.5) $\times 10^{-3}$		1030
$\omega \eta$		(1.58±0.16) $\times 10^{-3}$		1394
$\phi K \overline{K}$		(1.48±0.22) $\times 10^{-3}$		1179
$\phi f_J(1710) \rightarrow \phi K \overline{K}$		(3.6 ±0.6) $\times 10^{-4}$		875
$p \overline{p} \omega$		(1.30±0.25) $\times 10^{-3}$	S=1.3	769
$\Delta(1232)^{++} \overline{\Delta}(1232)^{--}$		(1.10±0.29) $\times 10^{-3}$		938
$\Sigma(1385)^- \overline{\Sigma}(1385)^+$ (or c.c.)	[gg]	(1.03±0.13) $\times 10^{-3}$		692
$p \overline{p} \eta'(958)$		(9 ±4) $\times 10^{-4}$	S=1.7	596
$\phi f'_2(1525)$		(8 ±4) $\times 10^{-4}$	S=2.7	871
$\phi \pi^+ \pi^-$		(8.0 ±1.2) $\times 10^{-4}$		1365

$\phi K^{\pm} K_S^0 \pi^{\mp}$	[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
$\Sigma \overline{\Sigma}$		$(3.8 \pm 0.5) \times 10^{-3}$		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
$K^0_SK^0_L$		$(1.08\pm0.14)\times10^{-4}$		1466
$\Lambda\overline{\Sigma}+$ c.c.		$<1.5\times10^{-4}$	CL=90%	1032
$K^0_SK^0_S$		$<5.2\times10^{-6}$	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
$\gamma\eta(1440)\to\gamma K\overline{K}\pi$	[p]	$(9.1\pm1.8)\times10^{-4}$		1223
$\gamma\eta(1440)\to\gamma\gamma\rho^0$		$(6.4\pm1.4)\times10^{-5}$		1223
$\gamma\rho\rho$		$(4.5\pm0.8)\times10^{-3}$		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
$\gamma\eta(1440)\to\gamma\rho^0\rho^0$		$(1.7\pm0.4)\times10^{-3}$	S=1.3	1223
$\gamma f_2(1270)$		$(1.38\pm0.14)\times10^{-3}$		1286
$\gamma f_J(1710)\to\gamma K\overline{K}$		$(9.7\pm1.2)\times10^{-4}$		1075
$\gamma\eta$		$(8.6\pm0.8)\times10^{-4}$		1500
$\gamma f_1(1420)\to\gamma K\overline{K}\pi$		$(8.3\pm1.5)\times10^{-4}$		1220
$\gamma f_1(1285)$		$(6.5\pm1.0)\times10^{-4}$		1283
$\gamma f'_2(1525)$		$(6.3\pm1.0)\times10^{-4}$		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
$\gamma\eta(1760)\to\gamma\rho^0\rho^0$		$(1.3\pm0.9)\times10^{-4}$		1048
$\gamma\pi^0$		$(3.9\pm1.3)\times10^{-5}$		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
$\gamma f_0(1370)$	(3.4 $\pm$0.7)	$\times 10^{-4}$		–
$\gamma f_0(1500)$	(8.2 $\pm$1.5)	$\times 10^{-4}$		1184

$\chi_{c0}(1P)$

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

Mass $m = 3415.1 \pm 1.0$ 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$\pm$0.7) %		1679
$\pi^+\pi^- K^+ K^-$	(3.0$\pm$0.7) %		1580
$\rho^0\pi^+\pi^-$	(1.6$\pm$0.5) %		1608
$3(\pi^+\pi^-)$	(1.5$\pm$0.5) %		1633
$K^+\overline{K}^*(892)^0\pi^- +$ c.c.	(1.2$\pm$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
$\pi^0\pi^0$	(3.1$\pm$0.6) $\times 10^{-3}$		1702
$\eta\eta$	(2.5$\pm$1.1) $\times 10^{-3}$		1617
$p\overline{p}$	$<$ 9.0 $\times 10^{-4}$	90%	1427
Radiative decays			
$\gamma J/\psi(1S)$	(6.6$\pm$1.8) $\times 10^{-3}$		303
$\gamma\gamma$	(4.0$\pm$2.3) $\times 10^{-4}$		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 ±4) $\times 10^{-3}$	1632
$\rho^0\pi^+\pi^-$	(3.9±3.5) $\times 10^{-3}$	1659
$K^+\overline{K}^*(892)^0\pi^- +$ c.c.	(3.2±2.1) $\times 10^{-3}$	1576
$\pi^+\pi^- p\overline{p}$	(1.4±0.9) $\times 10^{-3}$	1381
$p\overline{p}$	(8.6±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 ±4) $\times 10^{-3}$		1683
$K^+\overline{K}^*(892)^0\pi^- +$ c.c.	(4.8 ±2.8) $\times 10^{-3}$		1601
$\pi^+\pi^- p\overline{p}$	(3.3 ±1.3) $\times 10^{-3}$		1410
$\pi^+\pi^-$	(1.9 ±1.0) $\times 10^{-3}$		1773
K^+K^-	(1.5 ±1.1) $\times 10^{-3}$		1708
$p\overline{p}$	(10.0 ±1.0) $\times 10^{-5}$		1510
$\pi^0\pi^0$	(1.10±0.28) $\times 10^{-3}$		1773
$\eta\eta$	(8 ±5) $\times 10^{-4}$		1692
$J/\psi(1S)\pi^+\pi^-\pi^0$	< 1.5 %	90%	185

Radiative decays		
$\gamma J/\psi(1S)$	(13.5 ±1.1) %	430
$\gamma\gamma$	(1.6 ±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) %		–
$e^+ e^-$	(8.8 ±1.3) $\times 10^{-3}$		1843
$\mu^+ \mu^-$	(7.7 ±1.7) $\times 10^{-3}$		1840
Decays into $J/\psi(1S)$ and anything			
$J/\psi(1S)$ anything	(57 ±4) %		–
$J/\psi(1S)$ neutrals	(23.2 ±2.6) %		–
$J/\psi(1S)\pi^+\pi^-$	(32.4 ±2.6) %		477
$J/\psi(1S)\pi^0\pi^0$	(18.4 ±2.7) %		481
$J/\psi(1S)\eta$	(2.7 ±0.4) %	S=1.7	200
$J/\psi(1S)\pi^0$	(9.7 ±2.1) $\times 10^{-4}$		527
Hadronic decays			
$3(\pi^+\pi^-)\pi^0$	(3.5 ±1.6) $\times 10^{-3}$		1746
$2(\pi^+\pi^-)\pi^0$	(3.1 ±0.7) $\times 10^{-3}$		1799
$\pi^+\pi^- K^+ K^-$	(1.6 ±0.4) $\times 10^{-3}$		1726
$\pi^+\pi^- p\overline{p}$	(8.0 ±2.0) $\times 10^{-4}$		1491
$K^+\overline{K}^*(892)^0\pi^-$ + c.c.	(6.7 ±2.5) $\times 10^{-4}$		1673
$2(\pi^+\pi^-)$	(4.5 ±1.0) $\times 10^{-4}$		1817
$\rho^0\pi^+\pi^-$	(4.2 ±1.5) $\times 10^{-4}$		1751
$\overline{p}p$	(1.9 ±0.5) $\times 10^{-4}$		1586
$3(\pi^+\pi^-)$	(1.5 ±1.0) $\times 10^{-4}$		1774
$\overline{p}p\pi^0$	(1.4 ±0.5) $\times 10^{-4}$		1543
K^+K^-	(1.0 ±0.7) $\times 10^{-4}$		1776
$\pi^+\pi^-\pi^0$	(9 ±5) $\times 10^{-5}$		1830
$\pi^+\pi^-$	(8 ±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
$\rho\pi$	< 8.3 $\times 10^{-5}$	CL=90%	1760
$K^+K^-\pi^0$	< 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 ±0.8) %			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 ±0.6) $\times 10^{-3}$			639
$\gamma\pi^0$	< 5.4	$\times 10^{-3}$	CL=95%	1841
$\gamma\eta'(958)$	< 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

$\psi(3770)$ $I^G(J^{PC}) = ?^?(1^{--})$

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)

$\psi(3770)$ DECAY MODES	Fraction (Γ_i/Γ)	Scale factor	p (MeV/c)
$D\overline{D}$	dominant		242
e^+e^-	$(1.12\pm0.17) \times 10^{-5}$	1.2	1885

$\psi(4040)$ [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

$\psi(4040)$ DECAY MODES	Fraction (Γ_i/Γ)	p (MeV/c)
e^+e^-	$(1.4\pm0.4) \times 10^{-5}$	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

$\psi(4160)$ [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

$\psi(4160)$ DECAY MODES	Fraction (Γ_i/Γ)	p (MeV/c)
e^+e^-	$(10\pm4) \times 10^{-6}$	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	–
$e^+ e^-$	$(1.1 \pm 0.4) \times 10^{-5}$	2207