LIGHT UNFLAVORED MESONS ($S = C = B = 0$)

For $I = 1$ (π, b, ρ, a): $u\overline{d}$, $(u\overline{u}-d\overline{d})/\sqrt{2}$, $d\overline{u}$;
for $I = 0$ (η, η', h, h', ω, ϕ, f, f'): $c_1(u\overline{u} + d\overline{d}) + c_2(s\overline{s})$

$\pi^{\pm}$

$I^G(J^P) = 1^-(0^-)$

Mass $m = 139.57018 \pm 0.00035$ MeV (S = 1.2)
Mean life $\tau = (2.6033 \pm 0.0005) \times 10^{-8}$ s (S = 1.2)
$c\tau = 7.8045$ m

$\pi^{\pm} \to \ell^{\pm}\nu\gamma$ form factors [a]

$F_V = 0.017 \pm 0.008$
$F_A = 0.0116 \pm 0.0016$ (S = 1.3)
$R = 0.059^{+0.009}_{-0.008}$

π^- modes are charge conjugates of the modes below.

For decay limits to particles which are not established, see the appropriate Search setions (Massive Neutrino Peak Search Test, A^0 (axion), and Other Light Boson (X^0) Searches, etc.).

π^+ DECAY MODES		Fraction (Γ_i/Γ)	Confidence level	p (MeV/c)
$\mu^+\nu_\mu$	[b]	(99.98770 ± 0.00004) %		30
$\mu^+\nu_\mu\gamma$	[c]	$(2.00 \pm 0.25) \times 10^{-4}$		30
$e^+\nu_e$	[b]	$(1.230 \pm 0.004) \times 10^{-4}$		70
$e^+\nu_e\gamma$	[c]	$(1.61 \pm 0.23) \times 10^{-7}$		70
$e^+\nu_e\pi^0$		$(1.025 \pm 0.034) \times 10^{-8}$		4
$e^+\nu_e e^+ e^-$		$(3.2 \pm 0.5) \times 10^{-9}$		70
$e^+\nu_e\nu\overline{\nu}$		$< 5 \times 10^{-6}$	90%	70
Lepton Family number (LF) or Lepton number (L) violating modes				
$\mu^+\overline{\nu}_e$	L	[d] $< 1.5 \times 10^{-3}$	90%	30
$\mu^+\nu_e$	LF	[d] $< 8.0 \times 10^{-3}$	90%	30
$\mu^- e^+ e^+\nu$	LF	$< 1.6 \times 10^{-6}$	90%	30

π^0

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

Mass $m = 134.9766 \pm 0.0006$ MeV (S = 1.1)
$m_{\pi^\pm} - m_{\pi^0} = 4.5936 \pm 0.0005$ MeV
Mean life $\tau = (8.4 \pm 0.6) \times 10^{-17}$ s (S = 3.0)
$c\tau = 25.1$ nm

For decay limits to particles which are not established, see the appropriate Search setions (A^0 (axion), and Other Light Boson (X^0) Searches, etc.).

π^0 DECAY MODES		Fraction (Γ_i/Γ)	Scale factor/ Confidence level	p (MeV/c)
2γ		(98.798±0.032) %	S=1.1	67
$e^+ e^- \gamma$		(1.198±0.032) %	S=1.1	67
γ positronium		(1.82 ±0.29) $\times 10^{-9}$		67
$e^+ e^+ e^- e^-$		(3.14 ±0.30) $\times 10^{-5}$		67
$e^+ e^-$		(6.2 ±0.5) $\times 10^{-8}$		67
4γ		< 2	$\times 10^{-8}$ CL=90%	67
$\nu\overline{\nu}$	[e]	< 8.3	$\times 10^{-7}$ CL=90%	67
$\nu_e\overline{\nu}_e$		< 1.7	$\times 10^{-6}$ CL=90%	67
$\nu_\mu\overline{\nu}_\mu$		< 3.1	$\times 10^{-6}$ CL=90%	67
$\nu_\tau\overline{\nu}_\tau$		< 2.1	$\times 10^{-6}$ CL=90%	67
$\gamma\nu\overline{\nu}$		< 6	$\times 10^{-4}$ CL=90%	–
Charge conjugation (C) or Lepton Family number (LF) violating modes				
3γ	C	< 3.1	$\times 10^{-8}$ CL=90%	67
$\mu^+ e^-$	LF	< 3.8	$\times 10^{-10}$ CL=90%	26
$\mu^- e^+$	LF	< 3.4	$\times 10^{-9}$ CL=90%	–
$\mu^+ e^- + \mu^- e^+$	LF	< 1.72	$\times 10^{-8}$ CL=90%	26

η

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

Mass $m = 547.30 \pm 0.12$ MeV
Full width $\Gamma = 1.18 \pm 0.11$ keV [f] (S = 1.8)

C-nonconserving decay parameters

$\pi^+\pi^-\pi^0$	Left-right asymmetry $= (0.09 \pm 0.17) \times 10^{-2}$
$\pi^+\pi^-\pi^0$	Sextant asymmetry $= (0.18 \pm 0.16) \times 10^{-2}$
$\pi^+\pi^-\pi^0$	Quadrant asymmetry $= (-0.17 \pm 0.17) \times 10^{-2}$
$\pi^+\pi^-\gamma$	Left-right asymmetry $= (0.9 \pm 0.4) \times 10^{-2}$
$\pi^+\pi^-\gamma$	β (D-wave) $= -0.02 \pm 0.07$ (S = 1.3)

Dalitz plot parameter

$\pi^0\pi^0\pi^0$ $\quad \alpha = -0.031 \pm 0.004$ (S = 1.1)

η DECAY MODES		Fraction (Γ_i/Γ)	Scale factor/ Confidence level	p (MeV/c)
Neutral modes				
neutral modes		(72.0 ± 0.5) %	S=1.3	–
2γ	[f]	(39.43± 0.26) %	S=1.2	274
$3\pi^0$		(32.51± 0.29) %	S=1.2	178
$\pi^0 2\gamma$		(7.2 ± 1.4) $\times 10^{-4}$		257
other neutral modes		< 2.8 %	CL=90%	–
Charged modes				
charged modes		(28.0 ± 0.5) %	S=1.3	–
$\pi^+\pi^-\pi^0$		(22.6 ± 0.4) %	S=1.3	173
$\pi^+\pi^-\gamma$		(4.68± 0.11) %	S=1.2	235
$e^+e^-\gamma$		(6.0 ± 0.8) $\times 10^{-3}$	S=1.4	274
$\mu^+\mu^-\gamma$		(3.1 ± 0.4) $\times 10^{-4}$		252
e^+e^-		< 7.7 $\times 10^{-5}$	CL=90%	274
$\mu^+\mu^-$		(5.8 ± 0.8) $\times 10^{-6}$		252
$e^+e^-e^+e^-$		< 6.9 $\times 10^{-5}$	CL=90%	274
$\pi^+\pi^-e^+e^-$		(4.0 $^{+14.0}_{-2.7}$) $\times 10^{-4}$	S=5.8	235
$\pi^+\pi^-2\gamma$		< 2.0 $\times 10^{-3}$		235
$\pi^+\pi^-\pi^0\gamma$		< 5 $\times 10^{-4}$	CL=90%	173
$\pi^0\mu^+\mu^-\gamma$		< 3 $\times 10^{-6}$	CL=90%	210
Charge conjugation (C), Parity (P), Charge conjugation × Parity (CP), or Lepton Family number (LF) violating modes				
$\pi^+\pi^-$	P,CP	< 3.3 $\times 10^{-4}$	CL=90%	235
$\pi^0\pi^0$	P,CP	< 4.3 $\times 10^{-4}$	CL=90%	238
3γ	C	< 5 $\times 10^{-4}$	CL=95%	274
$4\pi^0$	P,CP	< 6.9 $\times 10^{-7}$	CL=90%	39
$\pi^0e^+e^-$	C [g]	< 4 $\times 10^{-5}$	CL=90%	257
$\pi^0\mu^+\mu^-$	C [g]	< 5 $\times 10^{-6}$	CL=90%	210
$\mu^+e^- + \mu^-e^+$	LF	< 6 $\times 10^{-6}$	CL=90%	263

$f_0(600)$ [h] or σ

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

Mass m = (400–1200) MeV
Full width Γ = (600–1000) MeV

$f_0(600)$ DECAY MODES	Fraction (Γ_i/Γ)	p (MeV/c)
$\pi\pi$	dominant	–
$\gamma\gamma$	seen	–

$\rho(770)$ [i]

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

Mass $m = 771.1 \pm 0.9$ MeV (S = 2.6)
Full width $\Gamma = 149.2 \pm 0.7$ MeV (S = 1.1)
$\Gamma_{ee} = 6.85 \pm 0.11$ keV

$\rho(770)$ DECAY MODES	Fraction (Γ_i/Γ)	Scale factor/ Confidence level	p (MeV/c)
$\pi\pi$	$\sim$ 100 %		358
$\rho(770)^\pm$ decays			
$\pi^\pm\gamma$	$(4.5 \pm 0.5) \times 10^{-4}$	S=2.2	372
$\pi^\pm\eta$	$< 6 \times 10^{-3}$	CL=84%	146
$\pi^\pm\pi^+\pi^-\pi^0$	$< 2.0 \times 10^{-3}$	CL=84%	249
$\rho(770)^0$ decays			
$\pi^+\pi^-\gamma$	$(9.9 \pm 1.6) \times 10^{-3}$		358
$\pi^0\gamma$	$(7.9 \pm 2.0) \times 10^{-4}$		372
$\eta\gamma$	$(3.8 \pm 0.7) \times 10^{-4}$		189
$\pi^0\pi^0\gamma$	$(4.8 \, {}^{+3.4}_{-1.9}) \times 10^{-5}$		–
$\mu^+\mu^-$ [j]	$(4.60 \pm 0.28) \times 10^{-5}$		369
e^+e^- [j]	$(4.54 \pm 0.10) \times 10^{-5}$	S=1.1	384
$\pi^+\pi^-\pi^0$	$< 1.2 \times 10^{-4}$	CL=90%	319
$\pi^+\pi^-\pi^+\pi^-$	$(1.8 \pm 0.9) \times 10^{-5}$		246
$\pi^+\pi^-\pi^0\pi^0$	$< 4 \times 10^{-5}$	CL=90%	252

$\omega(782)$

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

Mass $m = 782.57 \pm 0.12$ MeV (S = 1.8)
Full width $\Gamma = 8.44 \pm 0.09$ MeV
$\Gamma_{ee} = 0.60 \pm 0.02$ keV

$\omega(782)$ DECAY MODES	Fraction (Γ_i/Γ)	Scale factor/ Confidence level	p (MeV/c)
$\pi^+\pi^-\pi^0$	(89.1 ±0.7) %	S=1.1	327
$\pi^0\gamma$	(8.7 ±0.4) %		379
$\pi^+\pi^-$	(1.70±0.28) %	S=1.5	365
neutrals (excluding $\pi^0\gamma$)	(4.1 $^{+8.2}_{-2.8}$) $\times 10^{-3}$		–
$\eta\gamma$	(6.5 ±1.1) $\times 10^{-4}$		199
$\pi^0 e^+ e^-$	(5.9 ±1.9) $\times 10^{-4}$		379
$\pi^0\mu^+\mu^-$	(9.6 ±2.3) $\times 10^{-5}$		349
$e^+ e^-$	(6.95±0.15) $\times 10^{-5}$	S=1.1	391
$\pi^+\pi^-\pi^0\pi^0$	< 2 %	CL=90%	261
$\pi^+\pi^-\gamma$	< 3.6 $\times 10^{-3}$	CL=95%	365
$\pi^+\pi^-\pi^+\pi^-$	< 1 $\times 10^{-3}$	CL=90%	256
$\pi^0\pi^0\gamma$	(7.8 ±3.4) $\times 10^{-5}$		367
$\mu^+\mu^-$	(9.0 ±3.1) $\times 10^{-5}$		376
3γ	< 1.9 $\times 10^{-4}$	CL=95%	391
Charge conjugation (C) violating modes			
$\eta\pi^0$	C < 1 $\times 10^{-3}$	CL=90%	162
$3\pi^0$	C < 3 $\times 10^{-4}$	CL=90%	329

$\eta'(958)$

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

Mass $m = 957.78 \pm 0.14$ MeV
Full width $\Gamma = 0.202 \pm 0.016$ MeV (S = 1.3)

$\eta'(958)$ DECAY MODES	Fraction (Γ_i/Γ)	Scale factor/ Confidence level	p (MeV/c)
$\pi^+\pi^-\eta$	(44.3 ±1.5) %	S=1.2	232
$\rho^0\gamma$(including non-resonant $\pi^+\pi^-\gamma$)	(29.5 ±1.0) %	S=1.2	169
$\pi^0\pi^0\eta$	(20.9 ±1.2) %	S=1.2	239
$\omega\gamma$	(3.03±0.31) %		160
$\gamma\gamma$	(2.12±0.14) %	S=1.3	479
$3\pi^0$	(1.56±0.26) $\times 10^{-3}$		430
$\mu^+\mu^-\gamma$	(1.04±0.26) $\times 10^{-4}$		467
$\pi^+\pi^-\pi^0$	< 5 %	CL=90%	427
$\pi^0\rho^0$	< 4 %	CL=90%	118

$\pi^+\pi^+\pi^-\pi^-$	$<$	1	%	CL=90%	372
$\pi^+\pi^+\pi^-\pi^-$ neutrals	$<$	1	%	CL=95%	–
$\pi^+\pi^+\pi^-\pi^-\pi^0$	$<$	1	%	CL=90%	298
6π	$<$	1	%	CL=90%	189
$\pi^+\pi^-e^+e^-$	$<$	6	$\times 10^{-3}$	CL=90%	458
γe^+e^-	$<$	9	$\times 10^{-4}$	CL=90%	–
$\pi^0\gamma\gamma$	$<$	8	$\times 10^{-4}$	CL=90%	469
$4\pi^0$	$<$	5	$\times 10^{-4}$	CL=90%	379
e^+e^-	$<$	2.1	$\times 10^{-7}$	CL=90%	479

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

$\pi^+\pi^-$	P,CP		$<$	2	%	CL=90%	458
$\pi^0\pi^0$	P,CP		$<$	9	$\times 10^{-4}$	CL=90%	459
$\pi^0e^+e^-$	C	[g]	$<$	1.4	$\times 10^{-3}$	CL=90%	469
ηe^+e^-	C	[g]	$<$	2.4	$\times 10^{-3}$	CL=90%	322
3γ	C		$<$	1.0	$\times 10^{-4}$	CL=90%	479
$\mu^+\mu^-\pi^0$	C	[g]	$<$	6.0	$\times 10^{-5}$	CL=90%	445
$\mu^+\mu^-\eta$	C	[g]	$<$	1.5	$\times 10^{-5}$	CL=90%	274
$e\mu$	LF		$<$	4.7	$\times 10^{-4}$	CL=90%	–

$f_0(980)$ [k]

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

Mass $m = 980 \pm 10$ MeV
Full width $\Gamma = 40$ to 100 MeV

$f_0(980)$ DECAY MODES	Fraction (Γ_i/Γ)	p (MeV/c)
$\pi\pi$	dominant	470
$K\overline{K}$	seen	–

$a_0(980)$ [k]

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

Mass $m = 984.7 \pm 1.2$ MeV (S = 1.5)
Full width $\Gamma = 50$ to 100 MeV

$a_0(980)$ DECAY MODES	Fraction (Γ_i/Γ)	p (MeV/c)
$\eta\pi$	dominant	321
$K\overline{K}$	seen	–
$\gamma\gamma$	seen	492

$\phi(1020)$

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

Mass $m = 1019.456 \pm 0.020$ MeV (S = 1.1)
Full width $\Gamma = 4.26 \pm 0.05$ MeV (S = 1.7)

$\phi(1020)$ DECAY MODES	Fraction (Γ_i/Γ)	Scale factor/ Confidence level	p (MeV/c)
$K^+ K^-$	$(49.2\ ^{+0.6}_{-0.7})$ %	S=1.2	127
$K^0_L K^0_S$	(33.7 ± 0.5) %	S=1.2	110
$\rho\pi + \pi^+\pi^-\pi^0$	(15.5 ± 0.5) %	S=1.3	–
$\eta\gamma$	(1.299 ± 0.026) %	S=1.2	363
$\pi^0\gamma$	$(1.24 \pm 0.10) \times 10^{-3}$		501
$e^+ e^-$	$(2.96 \pm 0.04) \times 10^{-4}$	S=1.2	510
$\mu^+ \mu^-$	$(2.87\ ^{+0.18}_{-0.22}) \times 10^{-4}$		499
$\eta e^+ e^-$	$(1.15 \pm 0.10) \times 10^{-4}$		363
$\pi^+\pi^-$	$(7.3 \pm 1.3) \times 10^{-5}$		490
$\omega\pi^0$	$(5.2\ ^{+1.3}_{-1.1}) \times 10^{-5}$		–
$\omega\gamma$	< 5 %	CL=84%	210
$\rho\gamma$	$< 1.2 \times 10^{-5}$	CL=90%	219
$\pi^+\pi^-\gamma$	$(4.1 \pm 1.3) \times 10^{-5}$		490
$f_0(980)\gamma$	$(3.3\ ^{+0.8}_{-0.5}) \times 10^{-4}$		39
$\pi^0\pi^0\gamma$	$(1.08 \pm 0.19) \times 10^{-4}$		492
$\pi^+\pi^-\pi^+\pi^-$	$(4.0\ ^{+2.8}_{-2.2}) \times 10^{-6}$		410
$\pi^+\pi^+\pi^-\pi^-\pi^0$	$< 4.6 \times 10^{-6}$	CL=90%	341
$\pi^0 e^+ e^-$	$(1.2 \pm 0.4) \times 10^{-5}$		501
$\pi^0\eta\gamma$	$(8.9 \pm 1.4) \times 10^{-5}$		346
$a_0(980)\gamma$	$(8.8 \pm 1.7) \times 10^{-4}$		36
$\eta'(958)\gamma$	$(6.7\ ^{+1.5}_{-1.4}) \times 10^{-5}$		–
$\eta\pi^0\pi^0\gamma$	$< 2 \times 10^{-5}$	CL=90%	–
$\mu^+\mu^-\gamma$	$(1.4 \pm 0.5) \times 10^{-5}$		–
$\rho\gamma\gamma$	$< 5 \times 10^{-4}$	CL=90%	–
$\eta\pi^+\pi^-$	$< 1.8 \times 10^{-5}$	CL=90%	–
$\eta\mu^+\mu^-$	$< 9.4 \times 10^{-6}$	CL=90%	–

$h_1(1170)$ $I^G(J^{PC}) = 0^-(1^{+-})$

Mass $m = 1170 \pm 20$ MeV
Full width $\Gamma = 360 \pm 40$ MeV

$h_1(1170)$ DECAY MODES	Fraction (Γ_i/Γ)	p (MeV/c)
$\rho\pi$	seen	310

$b_1(1235)$ $I^G(J^{PC}) = 1^+(1^{+-})$

Mass $m = 1229.5 \pm 3.2$ MeV (S = 1.6)
Full width $\Gamma = 142 \pm 9$ MeV (S = 1.2)

$b_1(1235)$ DECAY MODES	Fraction (Γ_i/Γ)	Confidence level	p (MeV/c)
$\omega\pi$	dominant		348
[D/S amplitude ratio $= 0.29 \pm 0.04$]			
$\pi^\pm\gamma$	$(1.6\pm0.4)\times10^{-3}$		608
$\eta\rho$	seen		–
$\pi^+\pi^+\pi^-\pi^0$	< 50 %	84%	536
$(K\overline{K})^\pm\pi^0$	< 8 %	90%	248
$K^0_S K^0_L \pi^\pm$	< 6 %	90%	238
$K^0_S K^0_S \pi^\pm$	< 2 %	90%	238
$\phi\pi$	< 1.5 %	84%	146

$a_1(1260)$ [l] $I^G(J^{PC}) = 1^-(1^{++})$

Mass $m = 1230 \pm 40$ MeV [m]
Full width $\Gamma = 250$ to 600 MeV

$a_1(1260)$ DECAY MODES	Fraction (Γ_i/Γ)	p (MeV/c)
$(\rho\pi)_{S-\text{wave}}$	seen	–
$(\rho\pi)_{D-\text{wave}}$	seen	–
$(\rho(1450)\pi)_{S-\text{wave}}$	seen	–
$(\rho(1450)\pi)_{D-\text{wave}}$	seen	–
$\sigma\pi$	seen	–
$f_0(980)\pi$	not seen	–
$f_0(1370)\pi$	seen	–
$f_2(1270)\pi$	seen	–
$K\overline{K}^*(892)$+c.c.	seen	–
$\pi\gamma$	seen	607

$f_2(1270)$ $I^G(J^{PC}) = 0^+(2^{++})$

Mass $m = 1275.4 \pm 1.2$ MeV
Full width $\Gamma = 185.1^{+3.4}_{-2.6}$ MeV (S = 1.5)

$f_2(1270)$ DECAY MODES	Fraction (Γ_i/Γ)	Scale factor/ Confidence level	p (MeV/c)
$\pi\pi$	$(84.7\ ^{+2.4}_{-1.3})$ %	S=1.3	622
$\pi^+\pi^-2\pi^0$	$(7.1\ ^{+1.5}_{-2.6})$ %	S=1.3	562
$K\overline{K}$	(4.6 ± 0.5) %	S=2.8	403
$2\pi^+2\pi^-$	(2.8 ± 0.4) %	S=1.2	559
$\eta\eta$	$(4.5 \pm 1.0) \times 10^{-3}$	S=2.4	327
$4\pi^0$	$(3.0 \pm 1.0) \times 10^{-3}$		564
$\gamma\gamma$	$(1.41 \pm 0.13) \times 10^{-5}$		637
$\eta\pi\pi$	$< 8 \times 10^{-3}$	CL=95%	475
$K^0K^-\pi^+ +$ c.c.	$< 3.4 \times 10^{-3}$	CL=95%	293
e^+e^-	$< 6 \times 10^{-10}$	CL=90%	637

$f_1(1285)$ $I^G(J^{PC}) = 0^+(1^{++})$

Mass $m = 1281.9 \pm 0.6$ MeV (S = 1.6)
Full width $\Gamma = 24.0 \pm 1.2$ MeV (S = 1.4)

$f_1(1285)$ DECAY MODES	Fraction (Γ_i/Γ)	Scale factor/ Confidence level	p (MeV/c)
4π	$(33.1^{+\ 2.1}_{-\ 1.8})$ %	S=1.3	563
$\pi^0\pi^0\pi^+\pi^-$	$(22.0^{+\ 1.4}_{-\ 1.2})$ %	S=1.3	566
$2\pi^+2\pi^-$	$(11.0^{+\ 0.7}_{-\ 0.6})$ %	S=1.3	563
$\rho^0\pi^+\pi^-$	$(11.0^{+\ 0.7}_{-\ 0.6})$ %	S=1.3	340
$\rho^0\rho^0$	seen		–
$4\pi^0$	$< 7 \times 10^{-4}$	CL=90%	568
$\eta\pi\pi$	(52 ± 16) %		479
$a_0(980)\pi$ [ignoring $a_0(980) \to K\overline{K}$]	(36 ± 7) %		234
$\eta\pi\pi$ [excluding $a_0(980)\pi$]	(16 ± 7) %		–
$K\overline{K}\pi$	(9.0 ± 0.4) %	S=1.1	308
$K\overline{K}^*(892)$	not seen		–
$\gamma\rho^0$	(5.5 ± 1.3) %	S=2.8	410
$\phi\gamma$	$(7.4 \pm 2.6) \times 10^{-4}$		236

$\eta(1295)$

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

Mass $m = 1293 \pm 5$ MeV (S = 1.9)
Full width $\Gamma = 55 \pm 5$ MeV

$\eta(1295)$ DECAY MODES	Fraction (Γ_i/Γ)	p (MeV/c)
$\eta\pi^+\pi^-$	seen	488
$a_0(980)\pi$	seen	245
$\eta\pi^0\pi^0$	seen	–
$\eta(\pi\pi)_{S\text{-wave}}$	seen	–

$\pi(1300)$

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

Mass $m = 1300 \pm 100$ MeV [m]
Full width $\Gamma = 200$ to 600 MeV

$\pi(1300)$ DECAY MODES	Fraction (Γ_i/Γ)	p (MeV/c)
$\rho\pi$	seen	406

$a_2(1320)$

$I^G(J^{PC}) = 1^-(2^{++})$

Mass $m = 1318.0 \pm 0.6$ MeV (S = 1.1)
Full width $\Gamma = 107 \pm 5$ MeV [m]

$a_2(1320)$ DECAY MODES	Fraction (Γ_i/Γ)	Scale factor/ Confidence level	p (MeV/c)
$\rho\pi$	(70.1 ±2.7) %	S=1.2	419
$\eta\pi$	(14.5 ±1.2) %		535
$\omega\pi\pi$	(10.6 ±3.2) %	S=1.3	362
$K\overline{K}$	(4.9 ±0.8) %		437
$\eta'(958)\pi$	(5.3 ±0.9) $\times 10^{-3}$		287
$\pi^\pm\gamma$	(2.68±0.31) $\times 10^{-3}$		652
$\gamma\gamma$	(9.4 ±0.7) $\times 10^{-6}$		659
$\pi^+\pi^-\pi^-$	< 8 %	CL=90%	621
e^+e^-	< 6 $\times 10^{-9}$	CL=90%	659

$f_0(1370)$ [k]

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

Mass m = 1200 to 1500 MeV
Full width Γ = 200 to 500 MeV

$f_0(1370)$ DECAY MODES	Fraction (Γ_i/Γ)	p (MeV/c)
$\pi\pi$	seen	–
4π	seen	–
$4\pi^0$	seen	–
$2\pi^+2\pi^-$	seen	–
$\pi^+\pi^-2\pi^0$	seen	–
$\rho\rho$	dominant	–
$2(\pi\pi)_{S\text{-wave}}$	seen	–
$\eta\eta$	seen	–
$K\overline{K}$	seen	–
$\gamma\gamma$	seen	–
e^+e^-	not seen	–

$f_1(1420)$ [n]

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

Mass m = 1426.3 ± 1.1 MeV (S = 1.3)
Full width Γ = 55.5 ± 2.9 MeV

$f_1(1420)$ DECAY MODES	Fraction (Γ_i/Γ)	p (MeV/c)
$K\overline{K}\pi$	dominant	439
$K\overline{K}^*(892)+$ c.c.	dominant	155
$\eta\pi\pi$	possibly seen	571
$\phi\gamma$	seen	–

$\omega(1420)$ [o]

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

Mass m = 1419 ± 31 MeV
Full width Γ = 174 ± 60 MeV

$\omega(1420)$ DECAY MODES	Fraction (Γ_i/Γ)	p (MeV/c)
$\rho\pi$	dominant	488
$\omega\pi\pi$	possibly seen	–
$b_1(1235)\pi$	seen	–

$\eta(1440)$ [p]

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

Mass m = 1400 - 1470 MeV [m]
Full width Γ = 50 - 80 MeV [m]

$\eta(1440)$ DECAY MODES	Fraction (Γ_i/Γ)	p (MeV/c)
$K\overline{K}\pi$	seen	–
$K\overline{K}^*(892)+$ c.c.	seen	–
$\eta\pi\pi$	seen	–
$a_0(980)\pi$	seen	–
$\eta(\pi\pi)_S$-wave	seen	–
$f_0(980)\eta$	seen	–
4π	seen	–

$a_0(1450)$

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

Mass m = 1474 ± 19 MeV
Full width Γ = 265 ± 13 MeV

$a_0(1450)$ DECAY MODES	Fraction (Γ_i/Γ)	p (MeV/c)
$\pi\eta$	seen	613
$\pi\eta'(958)$	seen	392
$K\overline{K}$	seen	530

$\rho(1450)$ [q]

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

Mass m = 1465 ± 25 MeV [m]
Full width Γ = 310 ± 60 MeV [m]

$\rho(1450)$ DECAY MODES	Fraction (Γ_i/Γ)	Confidence level	p (MeV/c)
$\pi\pi$	seen		719
4π	seen		665
$\omega\pi$	<2.0 %	95%	512
e^+e^-	seen		732
$\eta\rho$	<4 %		317
$a_2(1320)\pi$	not seen		–
$\phi\pi$	<1 %		358
$K\overline{K}$	$<1.6\times10^{-3}$	95%	541
$\eta\gamma$	possibly seen		–

$f_0(1500)$ [r]

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

Mass $m = 1507 \pm 5$ MeV (S = 1.2)
Full width $\Gamma = 109 \pm 7$ MeV

$f_0(1500)$ DECAY MODES	Fraction (Γ_i/Γ)	p (MeV/c)
$\eta\eta'(958)$	seen	–
$\eta\eta$	seen	513
4π	seen	–
$4\pi^0$	seen	690
$2\pi^+ 2\pi^-$	seen	686
$\pi\pi$	seen	–
$\pi^+\pi^-$	seen	737
$2\pi^0$	seen	738
$K\overline{K}$	seen	563
$\gamma\gamma$	not seen	–

$f_2'(1525)$

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

Mass $m = 1525 \pm 5$ MeV [m]
Full width $\Gamma = 76 \pm 10$ MeV [m]

$f_2'(1525)$ DECAY MODES	Fraction (Γ_i/Γ)	p (MeV/c)
$K\overline{K}$	(88.8 ±3.1) %	581
$\eta\eta$	(10.3 ±3.1) %	531
$\pi\pi$	(8.2 ±1.5) $\times 10^{-3}$	750
$\gamma\gamma$	(1.23±0.17) $\times 10^{-6}$	763

$\omega(1650)$ [s]
was $\omega(1600)$

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

Mass $m = 1649 \pm 24$ MeV (S = 2.3)
Full width $\Gamma = 220 \pm 35$ MeV (S = 1.6)

$\omega(1650)$ DECAY MODES	Fraction (Γ_i/Γ)	p (MeV/c)
$\rho\pi$	seen	637
$\omega\pi\pi$	seen	601
$\omega\eta$	seen	–
$e^+ e^-$	seen	824

$\omega_3(1670)$

$I^G(J^{PC}) = 0^-(3^{--})$

Mass $m = 1667 \pm 4$ MeV
Full width $\Gamma = 168 \pm 10$ MeV [m]

$\omega_3(1670)$ DECAY MODES	Fraction (Γ_i/Γ)	p (MeV/c)
$\rho\pi$	seen	647
$\omega\pi\pi$	seen	614
$b_1(1235)\pi$	possibly seen	359

$\pi_2(1670)$

$I^G(J^{PC}) = 1^-(2^{-+})$

Mass $m = 1670 \pm 20$ MeV [m]
Full width $\Gamma = 259 \pm 10$ MeV [m] (S = 1.4)

$\pi_2(1670)$ DECAY MODES	Fraction (Γ_i/Γ)	Confidence level	p (MeV/c)
3π	(95.8±1.4) %		806
$f_2(1270)\pi$	(56.2±3.2) %		325
$\rho\pi$	(31 ±4) %		649
$\sigma\pi$	(13 ±6) %		–
$f_0(1370)\pi$	(8.7±3.4) %		–
$K\overline{K}^*(892)+$ c.c.	(4.2±1.4) %		453
$\omega\rho$	(2.7±1.1) %		–
$\rho(1450)\pi$	$< 3.6 \times 10^{-3}$	97.7%	–
$b_1(1235)\pi$	$< 1.9 \times 10^{-3}$	97.7%	–

$\phi(1680)$

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

Mass $m = 1680 \pm 20$ MeV [m]
Full width $\Gamma = 150 \pm 50$ MeV [m]

$\phi(1680)$ DECAY MODES	Fraction (Γ_i/Γ)	p (MeV/c)
$K\overline{K}^*(892)+$ c.c.	dominant	463
$K^0_S K\pi$	seen	620
$K\overline{K}$	seen	681
e^+e^-	seen	840
$\omega\pi\pi$	not seen	622

$\rho_3(1690)$ $I^G(J^{PC}) = 1^+(3^{--})$

Mass $m = 1691 \pm 5$ MeV [m]
Full width $\Gamma = 161 \pm 10$ MeV [m] (S = 1.5)

$\rho_3(1690)$ DECAY MODES	Fraction (Γ_i/Γ)	Scale factor	p (MeV/c)
4π	(71.1 ± 1.9) %		788
$\pi^\pm\pi^+\pi^-\pi^0$	(67 ±22) %		788
$\omega\pi$	(16 ± 6) %		656
$\pi\pi$	(23.6 ± 1.3) %		834
$K\overline{K}\pi$	(3.8 ± 1.2) %		628
$K\overline{K}$	(1.58± 0.26) %	1.2	686
$\eta\pi^+\pi^-$	seen		728
$\rho(770)\eta$	seen		–

$\rho(1700)$ [q] $I^G(J^{PC}) = 1^+(1^{--})$

Mass $m = 1700 \pm 20$ MeV [m] ($\eta\rho^0$ and $\pi^+\pi^-$ modes)
Full width $\Gamma = 240 \pm 60$ MeV [m] ($\eta\rho^0$ and $\pi^+\pi^-$ modes)

$\rho(1700)$ DECAY MODES	Fraction (Γ_i/Γ)	p (MeV/c)
$2(\pi^+\pi^-)$	large	792
$\rho\pi\pi$	dominant	640
$\rho^0\pi^+\pi^-$	large	640
$\rho^\pm\pi^\mp\pi^0$	large	642
$\pi^+\pi^-$	seen	838
$\pi\pi$	seen	839
$K\overline{K}^*(892)+$ c.c.	seen	479
$\eta\rho$	seen	533
$a_2(1320)\pi$	not seen	–
$K\overline{K}$	seen	692
e^+e^-	seen	850
$\pi^0\omega$	seen	662

$f_0(1710)$ [t]

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

Mass $m = 1713 \pm 6$ MeV
Full width $\Gamma = 125 \pm 10$ MeV

$f_0(1710)$ DECAY MODES	Fraction (Γ_i/Γ)	p (MeV/c)
$K\overline{K}$	seen	690
$\eta\eta$	seen	648
$\pi\pi$	seen	837

$\pi(1800)$

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

Mass $m = 1801 \pm 13$ MeV (S = 1.9)
Full width $\Gamma = 210 \pm 15$ MeV

$\pi(1800)$ DECAY MODES	Fraction (Γ_i/Γ)	p (MeV/c)
$\pi^+\pi^-\pi^-$	seen	–
$f_0(980)\pi^-$	seen	623
$f_0(1370)\pi^-$	seen	–
$\rho\pi^-$	not seen	728
$\eta\eta\pi^-$	seen	–
$a_0(980)\eta$	seen	459
$f_0(1500)\pi^-$	seen	240
$\eta\eta'(958)\pi^-$	seen	–
$K_0^*(1430)K^-$	seen	–
$K^*(892)K^-$	not seen	560

$\phi_3(1850)$

$I^G(J^{PC}) = 0^-(3^{--})$

Mass $m = 1854 \pm 7$ MeV
Full width $\Gamma = 87^{+28}_{-23}$ MeV (S = 1.2)

$\phi_3(1850)$ DECAY MODES	Fraction (Γ_i/Γ)	p (MeV/c)
$K\overline{K}$	seen	785
$K\overline{K}^*(892)+$ c.c.	seen	602

$f_2(2010)$

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

Mass $m = 2011^{+60}_{-80}$ MeV
Full width $\Gamma = 202 \pm 60$ MeV

$f_2(2010)$ DECAY MODES	Fraction (Γ_i/Γ)	p (MeV/c)
$\phi\phi$	seen	–

$a_4(2040)$

$I^G(J^{PC}) = 1^-(4^{++})$

Mass $m = 2011 \pm 13$ MeV
Full width $\Gamma = 360 \pm 40$ MeV

$a_4(2040)$ DECAY MODES	Fraction (Γ_i/Γ)	p (MeV/c)
$K\overline{K}$	seen	892
$\pi^+\pi^-\pi^0$	seen	–
$\eta\pi^0$	seen	941
$\eta'(958)\pi$	seen	–

$f_4(2050)$

$I^G(J^{PC}) = 0^+(4^{++})$

Mass $m = 2025 \pm 8$ MeV (S = 1.7)
Full width $\Gamma = 194 \pm 13$ MeV (S = 2.2)

$f_4(2050)$ DECAY MODES	Fraction (Γ_i/Γ)	p (MeV/c)
$\omega\omega$	not seen	658
$\pi\pi$	(17.0 ± 1.5) %	1012
$K\overline{K}$	$(\ 6.8^{+3.4}_{-1.8}) \times 10^{-3}$	895
$\eta\eta$	$(\ 2.1\pm0.8) \times 10^{-3}$	863
$4\pi^0$	$<\ 1.2$ %	977
$a_2(1320)\pi$	seen	–

$f_2(2300)$

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

Mass $m = 2297 \pm 28$ MeV
Full width $\Gamma = 149 \pm 40$ MeV

$f_2(2300)$ DECAY MODES	Fraction (Γ_i/Γ)	p (MeV/c)
$\phi\phi$	seen	529

$f_2(2340)$

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

Mass $m = 2339 \pm 60$ MeV
Full width $\Gamma = 319^{+80}_{-70}$ MeV

$f_2(2340)$ DECAY MODES	Fraction (Γ_i/Γ)	p (MeV/c)
$\phi\phi$	seen	573