Meson Full Listings

$\eta(1440)$

$\eta(1440)$ WIDTH

VALUE (MeV)	DOCUMENT ID
60±30 OUR ESTIMATE	This is only an educated guess; the error given is larger than the error on the average of the published values.

$\eta\pi\pi$ MODE

VALUE (MeV)	DOCUMENT ID		TECN	COMMENT
50± 8 OUR AVERAGE				
46±13	[13] BURCHELL	91	MRK3	$J/\psi \to \gamma\eta\pi^+\pi^-$
53±11	[14] AUGUSTIN	90	DM2	$J/\psi \to \gamma\eta\pi^+\pi^-$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
~ 50	[14] BEHREND	92	DM2	$J/\psi \to \gamma\eta\pi^+\pi^-$
59± 4	FUKUI	91C	SPEC	8.95 $\pi^- p \to \eta\pi^+\pi^- n$
31± 7	ANDO	86	SPEC	8 $\pi^- p \to n\eta\pi^+\pi^-$

[13] From fit to the $a_0(980)\pi$ 0^{-+} partial wave.

[14] From $\eta\pi^+\pi^-$ mass distribution - mainly $a_0(980)\pi$ - no spin–parity determination available.

$\pi\pi\gamma$ MODE

VALUE (MeV)	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
174±44	AUGUSTIN	90	DM2	$J/\psi \to \pi^+\pi^-\gamma\gamma$
60±30	[15] COFFMAN	90	MRK3	$J/\psi \to \pi^+\pi^- 2\gamma$

[15] This peak in the $\gamma\rho$ channel may not be related to the $\eta(1440)$.

4π MODE

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
144±13	3270	[16] BISELLO	89B	DM2	$J/\psi \to 4\pi\gamma$

[16] Estimated by us from various fits.

$K\overline{K}\pi$ MODE

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	COMMENT
66.0± 1.9 OUR AVERAGE					
63 ±18		AUGUSTIN	92	DM2	$J/\psi \to \gamma K\overline{K}\pi$
91 $^{+67}_{-31}$ $^{+15}_{-38}$		BAI	90C	MRK3	$J/\psi \to \gamma K^0_S K^\pm\pi^\mp$
62 ±16	500	DUCH	89	ASTE	$\overline{p}p \to K\overline{K}\pi\pi\pi$
66 ± 2	8800± 200	BIRMAN	88	MPS	8 $\pi^- p \to K^+\overline{K}{}^0\pi^- n$
60 ±10	620	[17] REEVES	86	SPEC	6.6 $p\overline{p} \to K K\pi$X
60 ±10		CHUNG	85	SPEC	8 $\pi^- p \to K\overline{K}\pi n$
80 ±10	800	[18] BAILLON	67	HBC	0.0 $\overline{p}p \to K\overline{K}\pi\pi\pi$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
75 ± 9		[19] AUGUSTIN	92	DM2	$J/\psi \to \gamma K\overline{K}\pi$
75 ± 9	693± 30	[19] AUGUSTIN	90	DM2	$J/\psi \to \gamma K^0_S K^\pm\pi^\mp$
93 ±14	296± 20	AUGUSTIN	90	DM2	$J/\psi \to \gamma K^+ K^-\pi^0$
105 ±10	693± 30	AUGUSTIN	90	DM2	$J/\psi \to \gamma K^0_S K^\pm\pi^\mp$
54 $^{+37}_{-21}$ $^{+13}_{-24}$		[20] BAI	90C	MRK3	$J/\psi \to \gamma K^0_S K^\pm\pi^\mp$
59 ± 4		[20] TAKAMATSU	90	SPEC	9 $\pi^- p \to n\eta\pi^+\pi^-$
82 ± 8		TAKAMATSU	90	SPEC	8 $\pi^- p \to n K^0_S K^\pm\pi^\mp$
57 ± 8		TAKAMATSU	90	SPEC	8 $\pi^- p \to n K^*(892) K$
51 ±13		[21] RATH	89	MPS	21.4 $\pi^- p \to n K^0_S K^0_S\pi^0$
99.9±11.4	170± 15	[22] RATH	89	MPS	21.4 $\pi^- p \to K^0_S K^0_S\pi^0 n$
19 ± 7		RATH	89	MPS	21.4 $\pi^- p \to n K^0_S K^0_S\pi^0$
160 ±11		WISNIEWSKI	87	MRK3	$J/\psi \to K\overline{K}\pi\gamma$
55 $^{+20}_{-30}$	174	EDWARDS	82E	CBAL	$J/\psi \to \gamma K^+ K^-\pi^0$
50 $^{+30}_{-20}$		SCHARRE	80	MRK2	$J/\psi \to \gamma K^0_S K^\pm\pi^\mp$

[17] From best fit to 0^{-+} partial wave , 50% $K^*(892)K$, 50% $a_0(980)\pi$.

[18] From fit to the 0^{-+} partial wave , mainly $a_0(980)\pi$.

[19] From fit to the $a_0(980)\pi$ 0^{-+} partial wave.

[20] From fit to the $K^*(892)K$ 0^{-+} partial wave.

[21] From fit to the $a_0(980)\pi$ 0^{-+} partial wave , but $a_0(980)\pi$ 1^{++} cannot be excluded. The fit is also consistent with one resonance at 1453 MeV.

[22] Best fit with a single Breit Wigner.

$\eta(1440)$ DECAY MODES

	Mode	Fraction (Γ_i/Γ)
Γ_1	$K\overline{K}\pi$	seen
Γ_2	$\eta\pi\pi$	seen
Γ_3	$a_0(980)\pi$	seen
Γ_4	$\pi\pi\rho$	
Γ_5	$K\overline{K}^*(892)+$ c.c.	
Γ_6	4π	seen
Γ_7	$\gamma\gamma$	
Γ_8	$\rho^0\gamma$	

$\eta(1440)$ Γ(i)$\Gamma(\gamma\gamma)/\Gamma$(total)

$\Gamma(K\overline{K}\pi) \times \Gamma(\gamma\gamma)/\Gamma_{total}$ $\quad\Gamma_1\Gamma_7/\Gamma$

VALUE (keV)	CL%	DOCUMENT ID		TECN	COMMENT
<1.2	95	BEHREND	89	CELL	$\gamma\gamma \to K^0_S K^\pm\pi^\mp$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<1.6	95	AIHARA	86D	TPC	$e^+e^- \to e^+e^- K^0_S K^\pm\pi^\mp$
<2.2	95	ALTHOFF	85B	TASS	$e^+e^- \to e^+e^- K\overline{K}\pi$
<8.0	95	JENNI	83	MRK2	$e^+e^- \to e^+e^- K\overline{K}\pi$

$\Gamma(\eta\pi\pi) \times \Gamma(\gamma\gamma)/\Gamma_{total}$ $\quad\Gamma_2\Gamma_7/\Gamma$

VALUE (keV)	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •			
<0.3	ANTREASYAN 87	CBAL	$e^+e^- \to e^+e^-\eta\pi\pi$

$\Gamma(\rho^0\gamma) \times \Gamma(\gamma\gamma)/\Gamma_{total}$ $\quad\Gamma_8\Gamma_7/\Gamma$

VALUE (keV)	CL%	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
<1.5	95	ALTHOFF	84E TASS	$e^+e^- \to e^+e^-\pi^+\pi^-\gamma$

$\eta(1440)$ BRANCHING RATIOS

$\Gamma(\eta\pi\pi)/\Gamma(K\overline{K}\pi)$ $\quad\Gamma_2/\Gamma_1$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
<0.5	90	EDWARDS	83B CBAL	$J/\psi \to \eta\pi\pi\gamma$
<1.1	90	SCHARRE	80 MRK2	$J/\psi \to \eta\pi\pi\gamma$
<1.5	95	FOSTER	68B HBC	0.0 $\overline{p}p$

$\Gamma(a_0(980)\pi)/\Gamma(K\overline{K}\pi)$ $\quad\Gamma_3/\Gamma_1$

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
~ 0.8	500	[23] DUCH	89 ASTE	$\overline{p}p \to \pi^+\pi^- K^\pm\pi^\mp K^0$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
~ 0.75		[23] REEVES	86 SPEC	6.6 $p\overline{p} \to K K\pi$X

[23] Assuming that the $a_0(980)$ decays only into $K\overline{K}$.

$\Gamma(K\overline{K}^*(892)+\text{c.c.})/\Gamma(K\overline{K}\pi)$ $\quad\Gamma_5/\Gamma_1$

VALUE	DOCUMENT ID	TECN	COMMENT
0.50± 0.10	BAILLON 67	HBC	0.0 $\overline{p}p \to K\overline{K}\pi\pi\pi$

$\Gamma(K\overline{K}^*(892)+\text{c.c.})/[\Gamma(a_0(980)\pi)+\Gamma(K\overline{K}^*(892)+\text{c.c.})]$ $\quad\Gamma_5/(\Gamma_3+\Gamma_5)$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
<0.25	90	EDWARDS	82E CBAL	$J/\psi \to K^+K^-\pi^0\gamma$

$\Gamma(\rho^0\gamma)/\Gamma(K\overline{K}\pi)$ $\quad\Gamma_8/\Gamma_1$

VALUE	DOCUMENT ID	TECN	COMMENT
0.0152± 0.0038	[24] COFFMAN 90	MRK3	$J/\psi \to \gamma\gamma\pi^+\pi^-$

[24] Using B($J/\psi \to \gamma\eta(1440) \to \gamma K\overline{K}\pi$)=4.2 × 10^{-3} and B($J/\psi \to \gamma\eta(1440) \to \gamma\gamma\rho^0$)=6.4 × 10^{-5} and assuming that the $\gamma\rho^0$ signal does not come from the $f_1(1420)$.

$\eta(1440)$ REFERENCES

AUGUSTIN	92	PR D46 1951	+Cosme	(DM2 Collab.)
BEHREND	92	ZPHY C56 381		(CELLO Collab.)
BURCHELL	91	NP B21 132 (suppl)		(Mark III Collab.)
FUKUI	91C	PL B267 293	+ (SUGI, NAGO, KEK, KYOT, MIYA, AKIT)	
AUGUSTIN	90	PR D42 10	+Cosme+	(DM2 Collab.)
BAI	90C	PRL 65 2507	+Blaylock+	(Mark III Collab.)
COFFMAN	90	PR D41 1410	+De Jongh+	(Mark III Collab.)
TAKAMATSU	90	Hadron 89 Conf. p 71	+Ando+	(KEK)
BEHREND	89	ZPHY C42 367	+Criegee+	(CELLO Collab.)
BISELLO	89B	PR D39 701	Busetto+	(DM2 Collab.)
DUCH	89	ZPHY 45 223	+Heel, Bailey+	(ASTERIX Collab.) JP
RATH	89	PR D40 693	+Cason+	(NDAM, BRAN, BNL, CUNY, DUKE)
BIRMAN	88	PRL 61 1557	+Chung, Peaslee+	(BNL, FSU, IND, MASD) JP
ANTREASYAN	87	PR D36 2633	+Bartels, Besset+	(Crystal Ball Collab.)
WISNIEWSKI	87	Hadron 87 Conf.		(Mark III Collab.)
AIHARA	86D	PRL 57 51	+Alston-Garnjost+	(TPC-2γ Collab.)
ANDO	86	PRL 57 1296	+Imai+	(KEK, KYOT, NIRS, SAGA, INUS, TSUK+) IJP
REEVES	86	PR 34 1960	+Chung, Crittenden+	(FLOR, BNL, IND, MASD) JP
ALTHOFF	85B	ZPHY C29 189	+Braunschweig, Kirschfink+	(TASSO Collab.)
CHUNG	85	PRL 55 779	+Fernow, Boehnlein+	(BNL, FLOR, IND, MASD) JP
ALTHOFF	84E	PL 147B 487	+Braunschweig, Kirschfink, Luebelsmeyer+	(TASSO Collab.)
EDWARDS	83B	PRL 51 859	+Partridge, Peck+	(CIT, HARV, PRIN, STAN, SLAC)
JENNI	83	PR D27 1031	+Burke, Telnov, Abrams, Blocker+	(SLAC, LBL)
EDWARDS	82E	PRL 49 259	+Partridge, Peck+	(CIT, HARV, PRIN, STAN, SLAC)
Also	83	PRL 50 219	Edwards, Partridge+	(CIT, HARV, PRIN, STAN+)
SCHARRE	80	PL 97B 329	+Trilling, Abrams, Alam, Blocker+	(SLAC, LBL)
FOSTER	68B	NP B8 174	+Gavillet, Labrosse, Montanet+	(CERN, CDEF)
BAILLON	67	NC 50A 393	+Edwards, D'Andlau, Astier+	(CERN, CDEF, IRAD)