$\eta(1405)$

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

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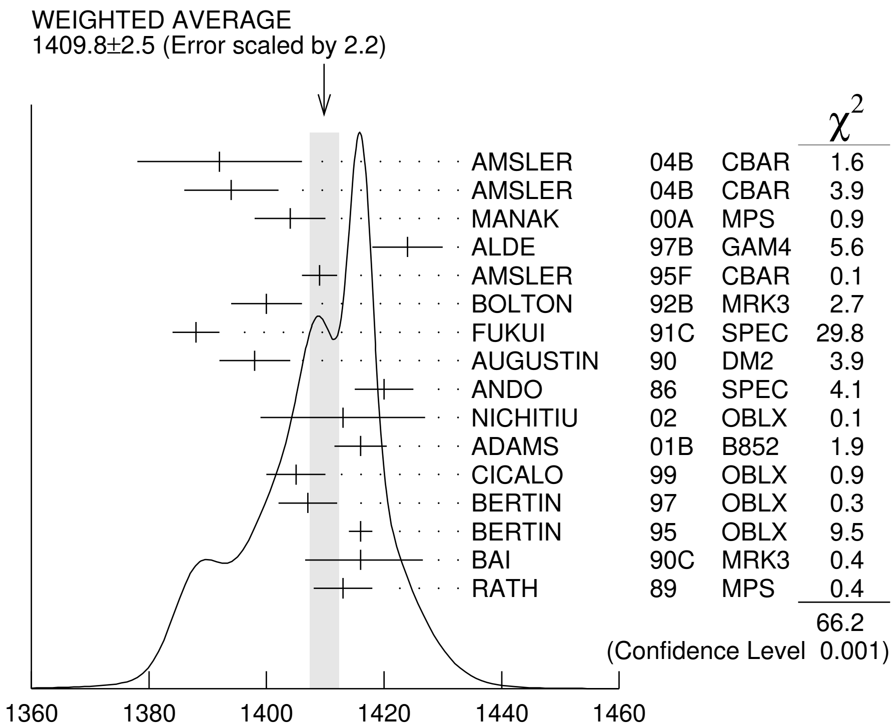
$\eta(1405)$ MASS

VALUE (MeV)	*DOCUMENT ID*

1409.8±2.5 OUR AVERAGE Includes data from the 2 datablocks that follow this one. Error includes scale factor of 2.2. See the ideogram below.



$\eta(1405)$ mass (MeV)

$\eta\pi\pi$ MODE

VALUE (MeV)	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*

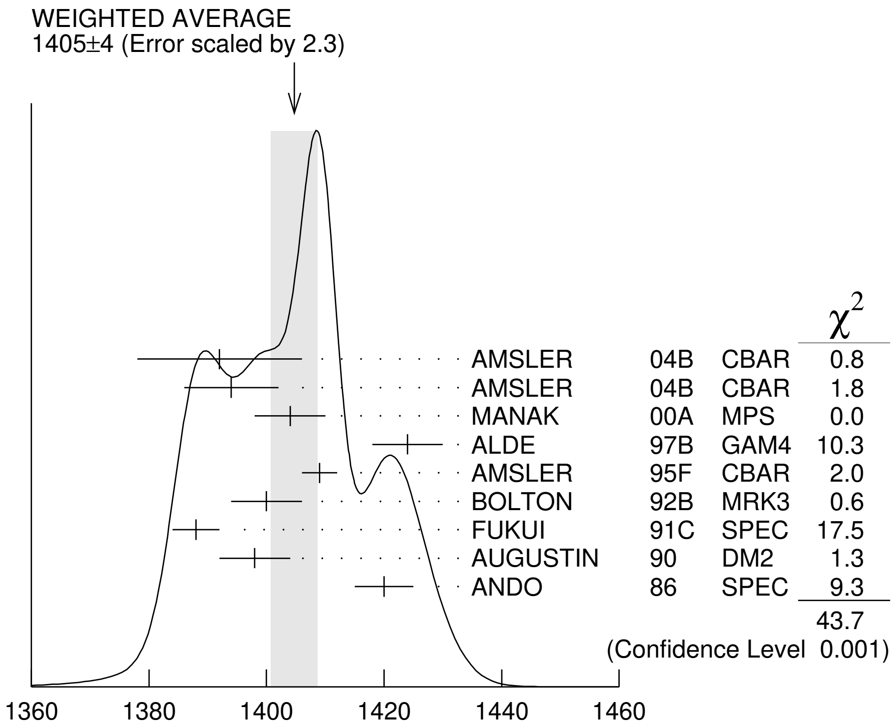
The data in this block is included in the average printed for a previous datablock.

1405± 4 OUR AVERAGE Error includes scale factor of 2.3. See the ideogram below.

VALUE (MeV)	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
1392±14	900 ± 375	AMSLER	04B	CBAR	0 $\overline{p}p \rightarrow \pi^+\pi^-\pi^+\pi^-\eta$
1394± 8	6.6 ± 2.0k	AMSLER	04B	CBAR	0 $\overline{p}p \rightarrow \pi^+\pi^-\pi^0\pi^0\eta$
1404± 6	9082	MANAK	00A	MPS	18 $\pi^- p \rightarrow \eta\pi^+\pi^- n$
1424± 6	2200	ALDE	97B	GAM4	100 $\pi^- p \rightarrow \eta\pi^0\pi^0 n$
1409± 3		AMSLER	95F	CBAR	0 $\overline{p}p \rightarrow \pi^+\pi^-\pi^0\pi^0\eta$
1400± 6		[1] BOLTON	92B	MRK3	$J/\psi \rightarrow \gamma\eta\pi^+\pi^-$
1388± 4		FUKUI	91C	SPEC	8.95 $\pi^- p \rightarrow \eta\pi^+\pi^- n$
1398± 6	261	[2] AUGUSTIN	90	DM2	$J/\psi \rightarrow \gamma\eta\pi^+\pi^-$
1420± 5		ANDO	86	SPEC	8 $\pi^- p \rightarrow \eta\pi^+\pi^- n$

• • • We do not use the following data for averages, fits, limits, etc. • • •

1385± 7	BAI	99	BES	$J/\psi \to \gamma\eta\pi^+\pi^-$



$\eta(1405)$ mass, $\eta\pi\pi$ mode (MeV)

$K\overline{K}\pi$ MODE ($a_0(980)\pi$ or direct $K\overline{K}\pi$)

The data in this block is included in the average printed for a previous datablock.

VALUE (MeV)	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
1413.9± 1.7 OUR AVERAGE		Error includes scale factor of 1.1.			
1413 ±14	3651	[3] NICHITIU	02	OBLX	
1416 ± 4 ±2	20k	ADAMS	01B	B852	18 GeV $\pi^- p \to K^+ K^- \pi^0 n$
1405 ± 5		[4] CICALO	99	OBLX	$0\ \overline{p}p \to K^\pm K^0_S \pi^\mp \pi^+ \pi^-$
1407 ± 5		[4] BERTIN	97	OBLX	$0\ \overline{p}p \to K^\pm (K^0) \pi^\mp \pi^+ \pi^-$
1416 ± 2		[4] BERTIN	95	OBLX	$0\ \overline{p}p \to K\overline{K}\pi\pi\pi$
1416 ± 8 $^{+7}_{-5}$	700	[5] BAI	90C	MRK3	$J/\psi \to \gamma K^0_S K^\pm \pi^\mp$
1413 ± 5		[5] RATH	89	MPS	21.4 $\pi^- p \to n K^0_S K^0_S \pi^0$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
1459 ± 5		[6] AUGUSTIN	92	DM2	$J/\psi \to \gamma K\overline{K}\pi$

$\pi\pi\gamma$ MODE

VALUE (MeV)	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
1390±12	235 ± 91	AMSLER	04B	CBAR	$0\ \overline{p}p \to \pi^+\pi^-\pi^+\pi^-\gamma$

• • • We do not use the following data for averages, fits, limits, etc. • • •

1424±10±11	547	BAI	04J	BES2	$J/\psi \to \gamma\gamma\pi^+\pi^-$
1401±18		[7,8] AUGUSTIN	90	DM2	$J/\psi \to \pi^+\pi^-\gamma\gamma$
1432± 8		[8] COFFMAN	90	MRK3	$J/\psi \to \pi^+\pi^- 2\gamma$

4π MODE

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
1420±20		BUGG	95	MRK3	$J/\psi \to \gamma\pi^+\pi^-\pi^+\pi^-$
1489±12	3270	[9] BISELLO	89B	DM2	$J/\psi \to 4\pi\gamma$

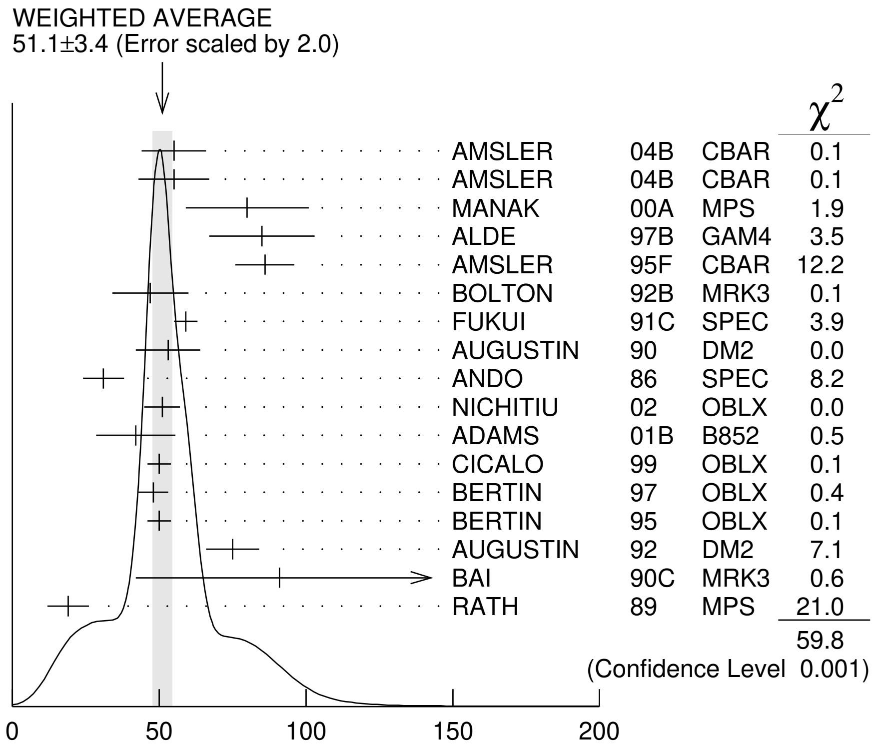
$K\overline{K}\pi$ MODE (unresolved)

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
1442±10	410	[10] BAI	98C	BES	$J/\psi \to \gamma K^+ K^- \pi^0$
1445± 8	693	[10] AUGUSTIN	90	DM2	$J/\psi \to \gamma K^0_S K^\pm \pi^\mp$
1433± 8	296	[10] AUGUSTIN	90	DM2	$J/\psi \to \gamma K^+ K^- \pi^0$
1413± 8	500	[10] DUCH	89	ASTE	$\overline{p}p \to \pi^+\pi^- K^\pm \pi^\mp K^0$
1453± 7	170	[10] RATH	89	MPS	$21.4\ \pi^- p \to K^0_S K^0_S \pi^0 n$
1419± 1	8800	[10] BIRMAN	88	MPS	$8\ \pi^- p \to K^+ \overline{K}^0 \pi^- n$
1424± 3	620	[10] REEVES	86	SPEC	$6.6\ p\overline{p} \to K\overline{K}\pi X$
1421± 2		[10] CHUNG	85	SPEC	$8\ \pi^- p \to K\overline{K}\pi n$
1440^{+20}_{-15}	174	[10] EDWARDS	82E	CBAL	$J/\psi \to \gamma K^+ K^- \pi^0$
1440^{+10}_{-15}		[10] SCHARRE	80	MRK2	$J/\psi \to \gamma K^0_S K^\pm \pi^\mp$
1425± 7	800	[10,11] BAILLON	67	HBC	$0\ \overline{p}p \to K\overline{K}\pi\pi\pi$

[1] From fit to the $a_0(980)\pi\ 0^{-+}$ partial wave.
[2] Best fit with a single Breit Wigner.
[3] Decaying dominantly directly to $K^+K^-\pi^0$.
[4] Decaying into $(K\overline{K})_S\pi$, $(K\pi)_S\overline{K}$, and $a_0(980)\pi$.
[5] From fit to the $a_0(980)\pi\ 0^{-+}$ partial wave. Cannot rule out a $a_0(980)\pi\ 1^{++}$ partial wave.
[6] Excluded from averaging because averaging would be meaningless.
[7] Best fit with a single Breit Wigner.
[8] This peak in the $\gamma\rho$ channel may not be related to the $\eta(1405)$.
[9] Estimated by us from various fits.
[10] These experiments identify only one pseudoscalar in the 1400–1500 range. Data could also refer to $\eta(1475)$.
[11] From best fit of 0^{-+} partial wave , 50% $K^*(892)K$, 50% $a_0(980)\pi$.

$\eta(1405)$ WIDTH

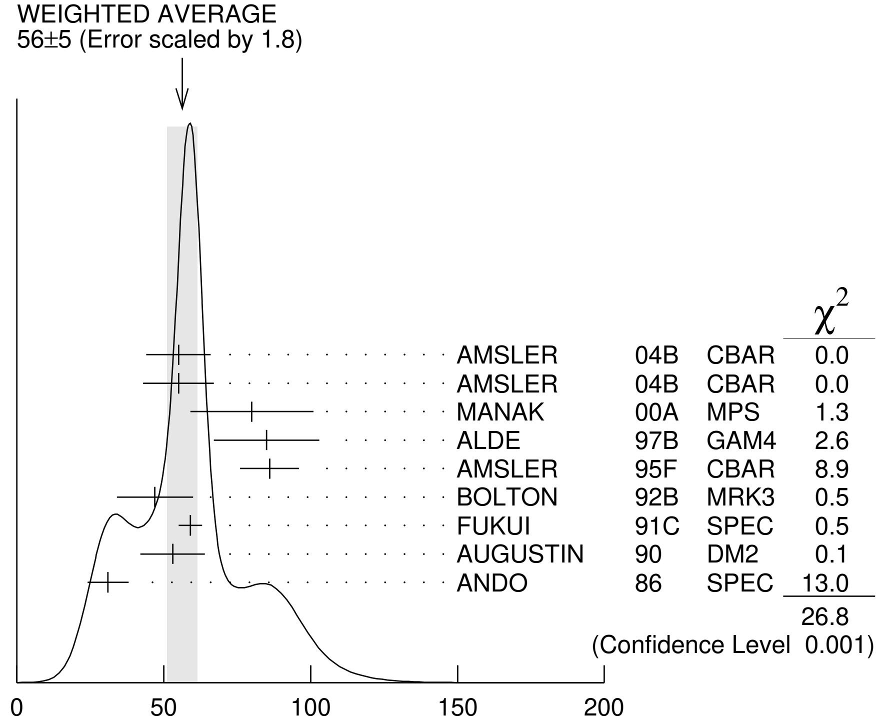
VALUE (MeV)	DOCUMENT ID
51.1±3.4 OUR AVERAGE Includes data from the 2 datablocks that follow this one. Error includes scale factor of 2.0. See the ideogram below.	



$\eta(1405)$ width (MeV)

$\eta\pi\pi$ MODE

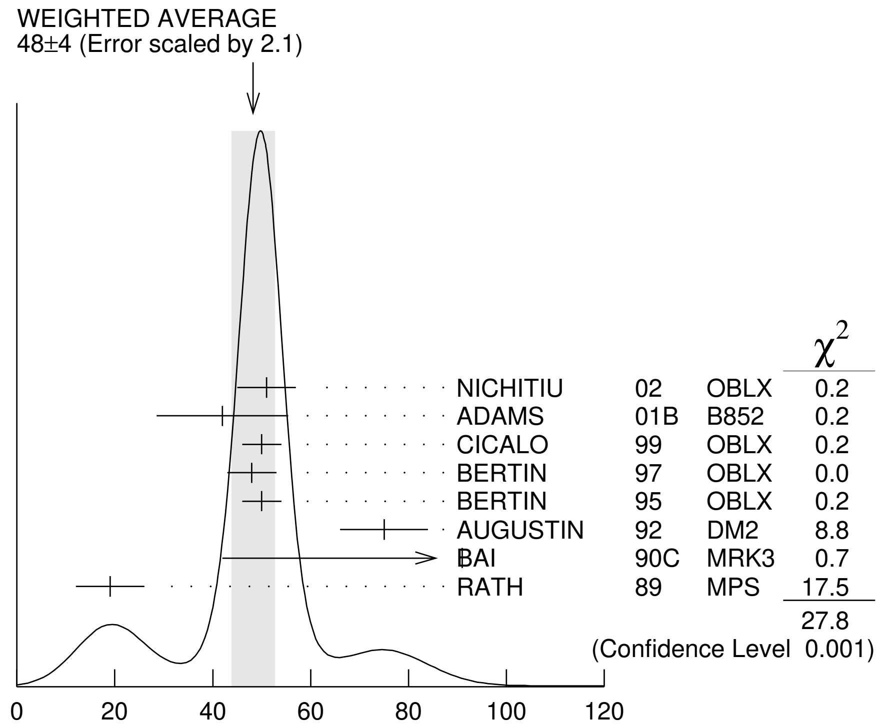
VALUE (MeV)	EVTS	DOCUMENT ID		TECN	COMMENT
The data in this block is included in the average printed for a previous datablock.					
56± 5 OUR AVERAGE Error includes scale factor of 1.8. See the ideogram below.					
55±11	900 ± 375	AMSLER	04B	CBAR	0 $\overline{p}p \rightarrow \pi^+\pi^-\pi^+\pi^-\eta$
55±12	6.6 ± 2.0k	AMSLER	04B	CBAR	0 $\overline{p}p \rightarrow \pi^+\pi^-\pi^0\pi^0\gamma$
80±21	9082	MANAK	00A	MPS	18 $\pi^- p \rightarrow \eta\pi^+\pi^- n$
85±18	2200	ALDE	97B	GAM4	100 $\pi^- p \rightarrow \eta\pi^0\pi^0 n$
86±10		AMSLER	95F	CBAR	0 $\overline{p}p \rightarrow \pi^+\pi^-\pi^0\pi^0\eta$
47±13		[12] BOLTON	92B	MRK3	$J/\psi \rightarrow \gamma\eta\pi^+\pi^-$
59± 4		FUKUI	91C	SPEC	8.95 $\pi^- p \rightarrow \eta\pi^+\pi^- n$
53±11		[13] AUGUSTIN	90	DM2	$J/\psi \rightarrow \gamma\eta\pi^+\pi^-$
31± 7		ANDO	86	SPEC	8 $\pi^- p \rightarrow \eta\pi^+\pi^- n$



$\eta(1405)$ width $\eta\pi\pi$ mode (MeV)

$K\overline{K}\pi$ MODE ($a_0(980)\pi$ or direct $K\overline{K}\pi$)

VALUE (MeV)	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
The data in this block is included in the average printed for a previous datablock.					
48± 4 OUR AVERAGE	Error includes scale factor of 2.1. See the ideogram below.				
51± 6	3651	[14] NICHITIU	02	OBLX	
42±10± 9	20k	ADAMS	01B	B852	18 GeV $\pi^- p \rightarrow K^+ K^- \pi^0 n$
50± 4		CICALO	99	OBLX	0 $\overline{p}p \rightarrow K^\pm K^0_S \pi^\mp \pi^+ \pi^-$
48± 5		[15] BERTIN	97	OBLX	0.0 $\overline{p}p \rightarrow K^\pm (K^0) \pi^\mp \pi^+ \pi^-$
50± 4		[15] BERTIN	95	OBLX	0 $\overline{p}p \rightarrow K\overline{K}\pi\pi\pi$
75± 9		AUGUSTIN	92	DM2	$J/\psi \rightarrow \gamma K\overline{K}\pi$
$91^{+67}_{-31}{}^{+15}_{-38}$		[16] BAI	90C	MRK3	$J/\psi \rightarrow \gamma K^0_S K^\pm \pi^\mp$
19± 7		[16] RATH	89	MPS	21.4 $\pi^- p \rightarrow n K^0_S K^0_S \pi^0$



$\eta(1405)$ width $K\overline{K}\pi$ mode ($a_0(980)\,\pi$ dominant)

$\pi\pi\gamma$ MODE

VALUE (MeV)	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
64 ±18	235 ± 91	AMSLER	04B	CBAR	0 $\overline{p}p \rightarrow \pi^+\pi^-\pi^+\pi^-\gamma$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
101.0± 8.8±8.8	547	BAI	04J	BES2	$J/\psi \rightarrow \gamma\gamma\pi^+\pi^-$
174 ±44		AUGUSTIN	90	DM2	$J/\psi \rightarrow \pi^+\pi^-\gamma\gamma$
90 ±26		[17] COFFMAN	90	MRK3	$J/\psi \rightarrow \pi^+\pi^- 2\gamma$

4π MODE

VALUE (MeV)	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
• • • We do not use the following data for averages, fits, limits, etc. • • •					
160±30		BUGG	95	MRK3	$J/\psi \rightarrow \gamma\pi^+\pi^-\pi^+\pi^-$
144±13	3270	[18] BISELLO	89B	DM2	$J/\psi \rightarrow 4\pi\gamma$

$K\overline{K}\pi$ MODE (unresolved)

VALUE (MeV)	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
• • • We do not use the following data for averages, fits, limits, etc. • • •					
93±14	296	[19] AUGUSTIN	90	DM2	$J/\psi \rightarrow \gamma K^+K^-\pi^0$
105±10	693	[19] AUGUSTIN	90	DM2	$J/\psi \rightarrow \gamma K^0_S K^\pm\pi^\mp$
62±16	500	[19] DUCH	89	ASTE	$\overline{p}p \rightarrow K\overline{K}\pi\pi\pi$
100±11	170	[19] RATH	89	MPS	21.4 $\pi^- p \rightarrow K^0_S K^0_S \pi^0 n$
66± 2	8800	[19] BIRMAN	88	MPS	8 $\pi^- p \rightarrow K^+\overline{K}^0\pi^- n$

60 ± 10	620	[19] REEVES	86	SPEC	$6.6\ p\overline{p} \rightarrow K K \pi X$
60 ± 10		[19] CHUNG	85	SPEC	$8\ \pi^- p \rightarrow K\overline{K}\pi n$
55^{+20}_{-30}	174	[19] EDWARDS	82E	CBAL	$J/\psi \rightarrow \gamma K^+ K^- \pi^0$
50^{+30}_{-20}		[19] SCHARRE	80	MRK2	$J/\psi \rightarrow \gamma K^0_S K^\pm \pi^\mp$
80 ± 10	800	[19,20] BAILLON	67	HBC	$0.0\ \overline{p}p \rightarrow K\overline{K}\pi\pi\pi$

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

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

[14] Decaying dominantly directly to $K^+K^-\pi^0$.

[15] Decaying into $(K\overline{K})_S\pi$, $(K\pi)_S\overline{K}$, and $a_0(980)\pi$.

[16] From fit to the $a_0(980)\pi$ 0^{-+} partial wave , but $a_0(980)\pi$ 1^{++} cannot be excluded.

[17] This peak in the $\gamma\rho$ channel may not be related to the $\eta(1405)$.

[18] Estimated by us from various fits.

[19] These experiments identify only one pseudoscalar in the 1400–1500 range. Data could also refer to $\eta(1475)$.

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

$\eta(1405)$ DECAY MODES

	Mode	Fraction (Γ_i/Γ)	Confidence level
Γ_1	$K\overline{K}\pi$	seen	
Γ_2	$\eta\pi\pi$	seen	
Γ_3	$a_0(980)\pi$	seen	
Γ_4	$\eta(\pi\pi)_{S\text{-wave}}$	seen	
Γ_5	$f_0(980)\eta$	seen	
Γ_6	4π	seen	
Γ_7	$\rho\rho$	<58 %	99.85%
Γ_8	$\gamma\gamma$		
Γ_9	$\rho^0\gamma$		
Γ_{10}	$\phi\gamma$		
Γ_{11}	$K^*(892)K$	seen	

$\eta(1405)$ $\Gamma(i)\Gamma(\gamma\gamma)/\Gamma(\text{total})$

$\Gamma(K\overline{K}\pi) \times \Gamma(\gamma\gamma)/\Gamma_{\text{total}}$ $\Gamma_1\Gamma_8/\Gamma$

VALUE (keV)	CL%	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.035	90	[21,22] AHOHE	05	CLE2	$10.6\ e^+e^- \rightarrow e^+e^- K^0_S K^\pm \pi^\mp$

$\Gamma(\eta\pi\pi) \times \Gamma(\gamma\gamma)/\Gamma_{\text{total}}$ $\Gamma_2\Gamma_8/\Gamma$

VALUE (keV)	CL%	DOCUMENT ID		TECN	COMMENT
<0.095	95	ACCIARRI	01G	L3	$183–202\ e^+e^- \rightarrow e^+e^-\eta\pi^+\pi^-$

$\Gamma(\rho^0\gamma) \times \Gamma(\gamma\gamma)/\Gamma_{\text{total}}$ — $\Gamma_9\Gamma_8/\Gamma$

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	$e^+e^- \to e^+e^-\pi^+\pi^-\gamma$

[21] Using $\eta(1405)$ mass and width 1410 MeV and 51 MeV, respectively.
[22] Assuming three-body phase-space decay to $K^0_S K^\pm \pi^\mp$.

η(1405) BRANCHING RATIOS

$\Gamma(\eta\pi\pi)/\Gamma(K\overline{K}\pi)$ — Γ_2/Γ_1

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
1.09±0.48		[23] AMSLER	04B	CBAR	$0\ \overline{p}p \to \pi^+\pi^-\pi^+\pi^-\eta$
<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	$0.0\ \overline{p}p$

$\Gamma(\rho^0\gamma)/\Gamma(\eta\pi\pi)$ — Γ_9/Γ_2

VALUE	DOCUMENT ID		TECN	COMMENT
0.111±0.064	AMSLER	04B	CBAR	$0\ \overline{p}p$

$\Gamma(a_0(980)\pi)/\Gamma(K\overline{K}\pi)$ — Γ_3/Γ_1

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
∼ 0.15		[24] BERTIN	95	OBLX	$0\ \overline{p}p \to K\overline{K}\pi\pi\pi$
∼ 0.8	500	[24] DUCH	89	ASTE	$\overline{p}p \to \pi^+\pi^-K^\pm\pi^\mp K^0$
∼ 0.75		[24] REEVES	86	SPEC	$6.6\ p\overline{p} \to KK\pi X$

$\Gamma(a_0(980)\pi)/\Gamma(\eta\pi\pi)$ — Γ_3/Γ_2

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.29±0.10		ABELE	98E	CBAR	$0\ p\overline{p} \to \eta\pi^0\pi^0\pi^0$
0.19±0.04	2200	[25] ALDE	97B	GAM4	$100\ \pi^-p \to \eta\pi^0\pi^0 n$
0.56±0.04±0.03		[25] AMSLER	95F	CBAR	$0\ \overline{p}p \to \pi^+\pi^-\pi^0\pi^0\eta$

$\Gamma(a_0(980)\pi)/\Gamma(\eta(\pi\pi)_{S\text{-wave}})$ — Γ_3/Γ_4

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.91±0.12		ANISOVICH	01	SPEC	$0.0\ \overline{p}p \to \eta\pi^+\pi^-\pi^+\pi^-$
0.15±0.04	9082	MANAK	00A	MPS	$18\ \pi^-p \to \eta\pi^+\pi^- n$
0.70±0.12±0.20		[26] BAI	99	BES	$J/\psi \to \gamma\eta\pi^+\pi^-$

$\Gamma(\rho^0\gamma)/\Gamma(K\overline{K}\pi)$ — Γ_9/Γ_1

VALUE	DOCUMENT ID		TECN	COMMENT
0.0152±0.0038	[27] COFFMAN	90	MRK3	$J/\psi \to \gamma\gamma\pi^+\pi^-$

$\Gamma(\eta(\pi\pi)_{S\text{-wave}})/\Gamma(\eta\pi\pi)$ — Γ_4/Γ_2

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.81±0.04	2200	ALDE	97B	GAM4	100 $\pi^- p \to \eta\pi^0\pi^0 n$

$\Gamma(a_0(980)\pi)/\Gamma(\eta(\pi\pi)_{S\text{-wave}})$ — Γ_3/Γ_4

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.32±0.07	[28] ANISOVICH	99I	SPEC	0.9–1.2 $\overline{p}p \to \eta 3\pi^0$

$\Gamma(\rho\rho)/\Gamma_{total}$ — Γ_7/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.58	99.85	[23,29] AMSLER	04B	CBAR	0 $\overline{p}p$

$\Gamma(K^*(892)K)/\Gamma(a_0(980)\pi)$ — Γ_{11}/Γ_3

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.084±0.024	[30] ADAMS	01B	B852	18 GeV $\pi^- p \to K^+K^-\pi^0 n$

$\Gamma(\phi\gamma)/\Gamma(\rho^0\gamma)$ — Γ_{10}/Γ_9

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.77	95	[31] BAI	04J	BES2	$J/\psi \to \gamma\gamma K^+K^-$

[23] Using the data of BAILLON 67 on $\overline{p}p \to K\overline{K}\pi$.
[24] Assuming that the $a_0(980)$ decays only into $K\overline{K}$.
[25] Assuming that the $a_0(980)$ decays only into $\eta\pi$.
[26] Assuming that the $a_0(980)$ decays only into $\eta\pi$.
[27] Using B($J/\psi \to \gamma\eta(1405) \to \gamma K\overline{K}\pi$)=$4.2 \times 10^{-3}$ and B($J/\psi \to \gamma\eta(1405) \to \gamma\gamma\rho^0$)=$6.4\times10^{-5}$ and assuming that the $\gamma\rho^0$ signal does not come from the $f_1(1420)$.
[28] Using preliminary Crystal Barrel data.
[29] Assuming that the $\eta(1405)$ decays are saturated by the $\pi\pi\eta$, $K\overline{K}\pi$ and $\rho\rho$ modes.
[30] Statistical error only.
[31] Calculated by us from B($J/\psi \to \eta(1405)\gamma \to \phi\gamma\gamma$) $< 0.82 \times 10^{-4}$ and B($J/\psi \to \eta(1405)\gamma \to \rho^0\gamma\gamma$) $= (1.07 \pm 0.17 \pm 0.11) \times 10^{-4}$.

$\eta(1405)$ REFERENCES

AHOHE	05	PR D71 072001	R. Ahohe *et al.*	(CLEO Collab.)	
AMSLER	04B	EPJ C33 23	C. Amsler *et al.*	(Crystal Barrel Collab.)	
BAI	04J	PL B594 47	J.Z. Bai *et al.*	(BES Collab.)	
NICHITIU	02	PL B545 261	F. Nichitiu *et al.*	(OBELIX Collab.)	
ACCIARRI	01G	PL B501 1	M. Acciarri *et al.*	(L3 Collab.)	
ADAMS	01B	PL B516 264	G.S. Adams *et al.*	(BNL E852 Collab.)	
ANISOVICH	01	NP A690 567	A.V. Anisovich *et al.*		
MANAK	00A	PR D62 012003	J.J. Manak *et al.*	(BNL E852 Collab.)	
ANISOVICH	99I	PL B468 304	A.V. Anisovich *et al.*		
BAI	99	PL B446 356	J.Z. Bai *et al.*	(BES Collab.)	
CICALO	99	PL B462 453	C. Cicalo *et al.*	(OBELIX Collab.)	
ABELE	98E	NP B514 45	A. Abele *et al.*	(Crystal Barrel Collab.)	
BAI	98C	PL B440 217	J.Z. Bai *et al.*	(BES Collab.)	
ALDE	97B	PAN 60 386	D. Alde *et al.*	(GAMS Collab.)	
		Translated from YAF 60 458.			
BERTIN	97	PL B400 226	A. Bertin *et al.*	(OBELIX Collab.)	
AMSLER	95F	PL B358 389	C. Amsler *et al.*	(Crystal Barrel Collab.)	
BERTIN	95	PL B361 187	A. Bertin *et al.*	(OBELIX Collab.)	
BUGG	95	PL B353 378	D.V. Bugg *et al.*	(LOQM, PNPI, WASH)	
AUGUSTIN	92	PR D46 1951	J.E. Augustin, G. Cosme	(DM2 Collab.)	
BOLTON	92B	PRL 69 1328	T. Bolton *et al.*	(Mark III Collab.)	
FUKUI	91C	PL B267 293	S. Fukui *et al.*	(SUGI, NAGO, KEK, KYOT+)	
AUGUSTIN	90	PR D42 10	J.E. Augustin *et al.*	(DM2 Collab.)	
BAI	90C	PRL 65 2507	Z. Bai *et al.*	(Mark III Collab.)	
COFFMAN	90	PR D41 1410	D.M. Coffman *et al.*	(Mark III Collab.)	
BISELLO	89B	PR D39 701	G. Busetto *et al.*	(DM2 Collab.)	
DUCH	89	ZPHY C45 223	K.D. Duch *et al.*	(ASTERIX Collab.)	JP
RATH	89	PR D40 693	M.G. Rath *et al.*	(NDAM, BRAN, BNL, CUNY+)	
BIRMAN	88	PRL 61 1557	A. Birman *et al.*	(BNL, FSU, IND, MASD)	JP
ANDO	86	PRL 57 1296	A. Ando *et al.*	(KEK, KYOT, NIRS, SAGA+)	IJP
REEVES	86	PR D34 1960	D.F. Reeves *et al.*	(FLOR, BNL, IND+)	JP
CHUNG	85	PRL 55 779	S.U. Chung *et al.*	(BNL, FLOR, IND+)	JP
ALTHOFF	84E	PL 147B 487	M. Althoff *et al.*	(TASSO Collab.)	
EDWARDS	83B	PRL 51 859	C. Edwards *et al.*	(CIT, HARV, PRIN+)	
EDWARDS	82E	PRL 49 259	C. Edwards *et al.*	(CIT, HARV, PRIN+)	
Also		PRL 50 219	C. Edwards *et al.*	(CIT, HARV, PRIN+)	
SCHARRE	80	PL 97B 329	D.L. Scharre *et al.*	(SLAC, LBL)	
FOSTER	68B	NP B8 174	M. Foster *et al.*	(CERN, CDEF)	
BAILLON	67	NC 50A 393	P.H. Baillon *et al.*	(CERN, CDEF, IRAD)	

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LI	03C	EPJ C28 335	D.M. Li *et al.*	
LI	03D	IJMP A18 3335	D.M. Li *et al.*	
ADAMS	01	PRL 87 041801	T. Adams *et al.*	(NuTeV Collab.)
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CARVALHO	99	EPJ C7 95	W.S. Carvalho *et al.*	
ABELE	98	PR D57 3860	A. Abele *et al.*	(Crystal Barrel Collab.)
NEKRASOV	98	EPJ C5 507	M.L. Nekrasov	
BARBERIS	97C	PL B413 225	D. Barberis *et al.*	(WA 102 Collab.)
BARNES	97	PR D55 4157	T. Barnes *et al.*	(ORNL, RAL, MCHS)
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CLOSE	97B	PR D55 5749	F. Close *et al.*	(RAL, RUTG, BEIJT)
CLOSE	97D	ZPHY C76 469	F.E. Close *et al.*	
BERTIN	96	PL B385 493	A. Bertin *et al.*	(Obelix Collab.)
FARRAR	96	PRL 76 4111	G.R. Farrar	(RUTG)
AMELIN	95	ZPHY C66 71	D.V. Amelin *et al.*	(VES Collab.)
GENOVESE	94	ZPHY C61 425	M. Genovese, D.B. Lichtenberg, E. Predazzi	(TORI+)
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CALDWELL	90	Hadron 89 Conf. p 127	D.O. Caldwell	(UCSB)
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AHMAD	89	NP B (PROC.)8 50	S. Ahmad *et al.*	(ASTERIX Collab.)

ARMSTRONG	89	PL B221 216	T.A. Armstrong *et al.*	(CERN, CDEF, BIRM+)
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