

$\eta(1405)$
was $\eta(1440)$

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

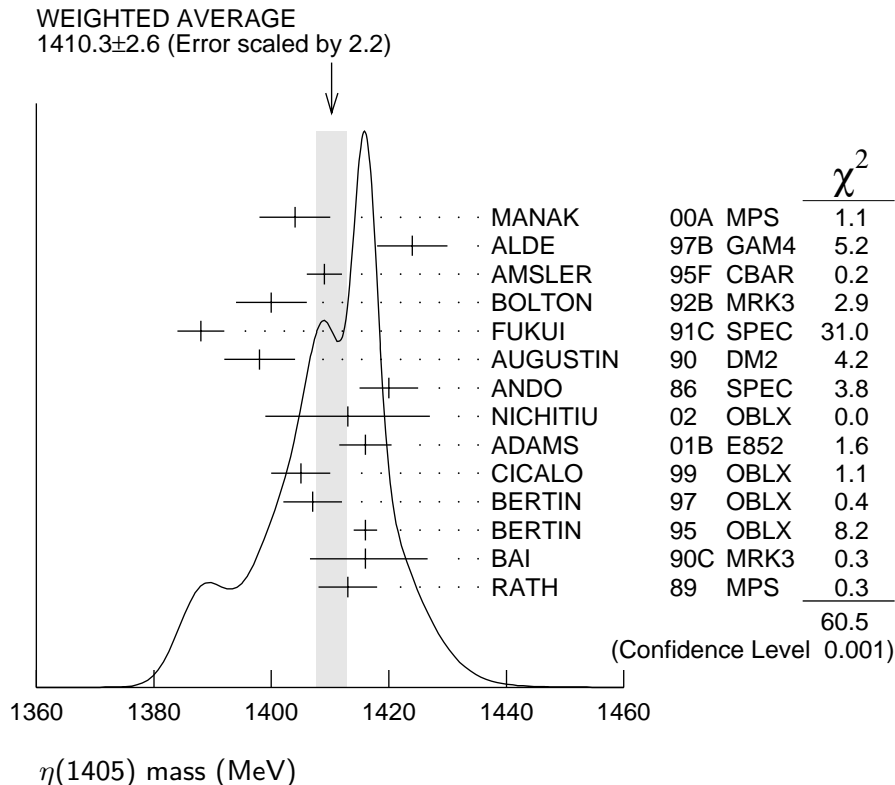
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$\eta(1405)$ MASS

VALUE (MeV)

DOCUMENT ID

1410.3±2.6 OUR AVERAGE Includes data from the 2 datablocks that follow this one. Error includes scale factor of 2.2. See the ideogram below.



$\eta\pi\pi$ MODE

VALUE (MeV)

EVTS

DOCUMENT ID

TECN

COMMENT

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

1405±5 OUR AVERAGE Error includes scale factor of 2.6. See the ideogram below.

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 $\bar{p}p \rightarrow \pi^+\pi^-\pi^0\pi^0\eta$
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. ● ● ●

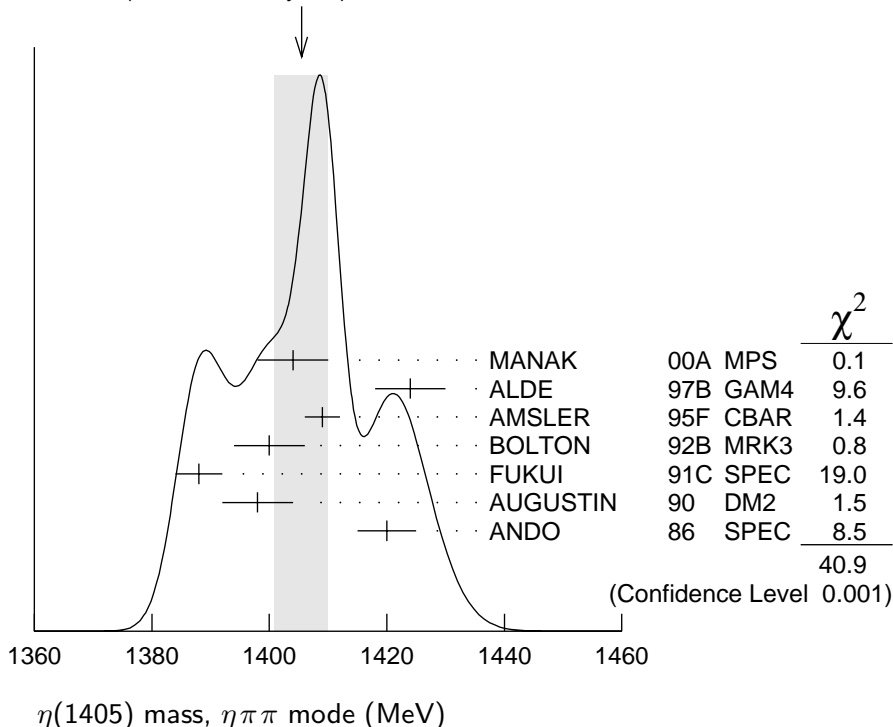
1385 ± 7

BAI

99 BES

$J/\psi \rightarrow \gamma \pi^+ \pi^-$

WEIGHTED AVERAGE
1405 ± 5 (Error scaled by 2.6)



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

VALUE (MeV) EVTS DOCUMENT ID TECN COMMENT
The data in this block is included in the average printed for a previous datablock.

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 E852	18 GeV $\pi^- p \rightarrow K^+ K^- \pi^0 n$
1405 ± 5		⁴ CICALO	99 OBLX	0 $\bar{p} p \rightarrow K^\pm K_S^0 \pi^\mp \pi^+ \pi^-$
1407 ± 5		⁴ BERTIN	97 OBLX	0 $\bar{p} p \rightarrow K^\pm (K^0) \pi^\mp \pi^+ \pi^-$
1416 ± 2		⁴ BERTIN	95 OBLX	0 $\bar{p} p \rightarrow K \bar{K} \pi \pi \pi$
1416 ± 8 ⁺⁷ / ₋₅	700	⁵ BAI	90C MRK3	$J/\psi \rightarrow \gamma K_S^0 K^\pm \pi^\mp$
1413 ± 5		⁵ RATH	89 MPS	21.4 $\pi^- p \rightarrow n K_S^0 K_S^0 \pi^0$

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

1459 ± 5		⁶ AUGUSTIN	92 DM2	$J/\psi \rightarrow \gamma K \bar{K} \pi$
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$\pi \pi \gamma$ MODE

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

<u>VALUE (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
1401 ± 18	^{7,8} AUGUSTIN	90 DM2	$J/\psi \rightarrow \pi^+ \pi^- \gamma \gamma$
1432 ± 8	⁸ COFFMAN	90 MRK3	$J/\psi \rightarrow \pi^+ \pi^- 2\gamma$

4 π MODE

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

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

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

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 $(K\bar{K})_S \pi$, $(K\pi)_S \bar{K}$, 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 γp channel may not be related to the $\eta(1405)$.

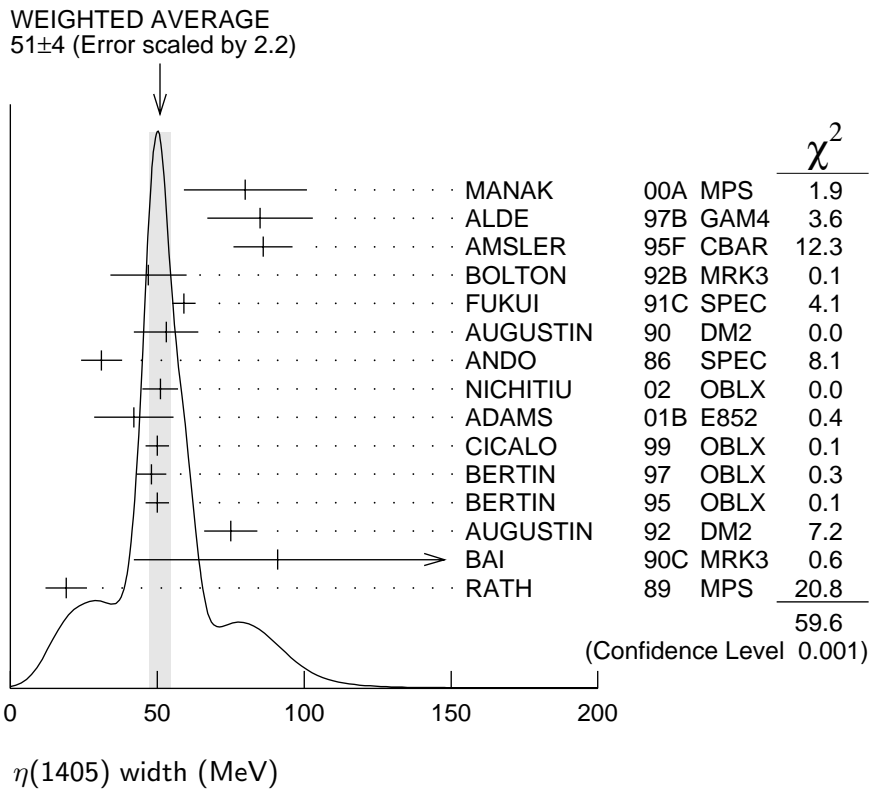
⁹ Estimated by us from various fits.

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\pm4 OUR AVERAGE	Includes data from the 2 datablocks that follow this one. Error includes scale factor of 2.2. See the ideogram below.

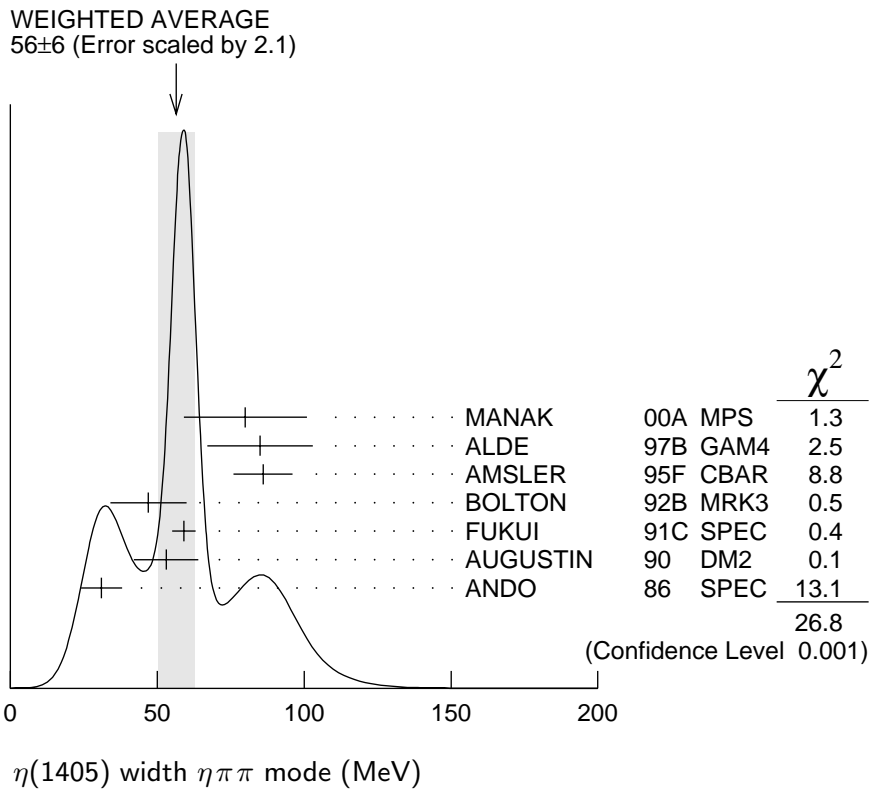


$\eta\pi\pi$ MODE

VALUE (MeV) EVTS DOCUMENT ID TECN COMMENT
 The data in this block is included in the average printed for a previous datablock.

56± 6 OUR AVERAGE Error includes scale factor of 2.1. See the ideogram below.

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 $\bar{p}p \rightarrow \pi^+\pi^-\pi^0\pi^0\eta$
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 $\pi^- p \rightarrow \eta\pi^+\pi^- n$



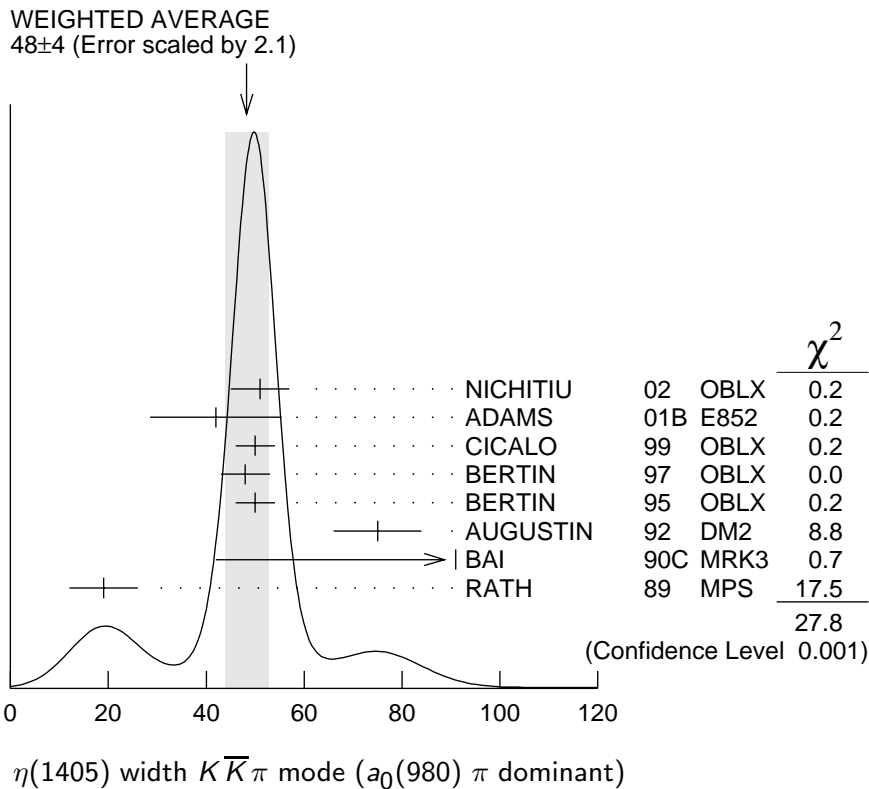
$K\bar{K}\pi$ MODE ($a_0(980)\pi$ or direct $K\bar{K}\pi$)

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	E852	18 GeV $\pi^- p \rightarrow K^+ K^- \pi^0 n$
50± 4		CICALO	99	OBLX	0 $\bar{p} p \rightarrow K^\pm K_S^0 \pi^\mp \pi^+ \pi^-$
48± 5		¹⁵ BERTIN	97	OBLX	0.0 $\bar{p} p \rightarrow K^\pm (K^0) \pi^\mp \pi^+ \pi^-$
50± 4		¹⁵ BERTIN	95	OBLX	0 $\bar{p} p \rightarrow K\bar{K}\pi\pi\pi$
75± 9		AUGUSTIN	92	DM2	$J/\psi \rightarrow \gamma K\bar{K}\pi$
91 ⁺⁶⁷⁺¹⁵ ₋₃₁₋₃₈		¹⁶ BAI	90C	MRK3	$J/\psi \rightarrow \gamma K_S^0 K^\pm \pi^\mp$
19± 7		¹⁶ RATH	89	MPS	21.4 $\pi^- p \rightarrow n K_S^0 K_S^0 \pi^0$



$\pi\pi\gamma$ MODE

VALUE (MeV)	DOCUMENT ID	TECN	COMMENT
174 ± 44	AUGUSTIN	90 DM2	$J/\psi \rightarrow \pi^+ \pi^- \gamma \gamma$
90 ± 26	17 COFFMAN	90 MRK3	$J/\psi \rightarrow \pi^+ \pi^- 2\gamma$

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

4π MODE

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
160 ± 30		BUGG	95 MRK3	$J/\psi \rightarrow \gamma \pi^+ \pi^- \pi^+ \pi^-$
144 ± 13	3270	18 BISELLO	89B DM2	$J/\psi \rightarrow 4\pi \gamma$

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

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

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
93 ± 14	296	19 AUGUSTIN	90 DM2	$J/\psi \rightarrow \gamma K^+ K^- \pi^0$
105 ± 10	693	19 AUGUSTIN	90 DM2	$J/\psi \rightarrow \gamma K_S^0 K^\pm \pi^\mp$
62 ± 16	500	19 DUCH	89 ASTE	$\bar{p}p \rightarrow K\bar{K}\pi\pi\pi$
100 ± 11	170	19 RATH	89 MPS	$21.4 \pi^- p \rightarrow K_S^0 K_S^0 \pi^0 n$
66 ± 2	8800	19 BIRMAN	88 MPS	$8 \pi^- p \rightarrow K^+ \bar{K}^0 \pi^- n$

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

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

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 $(K\bar{K})_S\pi$, $(K\pi)_S\bar{K}$, 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)
Γ_1 $K\bar{K}\pi$	seen
Γ_2 $\eta\pi\pi$	seen
Γ_3 $a_0(980)\pi$	seen
Γ_4 $\eta(\pi\pi)_S$ -wave	seen
Γ_5 $f_0(980)\eta$	seen
Γ_6 4π	seen
Γ_7 $\gamma\gamma$	
Γ_8 $\rho^0\gamma$	
Γ_9 $K^*(892)K$	seen

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

$\Gamma(\eta\pi\pi) \times \Gamma(\gamma\gamma)/\Gamma_{\text{total}}$					$\Gamma_2\Gamma_7/\Gamma$
VALUE (keV)	CL%	DOCUMENT ID	TECN	COMMENT	
<0.095	95	ACCIARRI	01G L3	183–202 $e^+e^- \rightarrow e^+e^-\eta\pi^+\pi^-$	

$\Gamma(\rho^0\gamma) \times \Gamma(\gamma\gamma)/\Gamma_{\text{total}}$					$\Gamma_8\Gamma_7/\Gamma$
VALUE (keV)	CL%	DOCUMENT ID	TECN	COMMENT	
<1.5	95	ALTHOFF	84E TASS	$e^+e^- \rightarrow e^+e^-\pi^+\pi^-\gamma$	

$\eta(1405)$ BRANCHING RATIOS

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

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

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

<u>VALUE</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●				
~ 0.15		21 BERTIN	95 OBLX	0 $\bar{p}p \rightarrow K\bar{K}\pi\pi\pi$
~ 0.8	500	21 DUCH	89 ASTE	$\bar{p}p \rightarrow$ $\pi^+\pi^-\pi^+\pi^-\pi^0 K^0$
~ 0.75		21 REEVES	86 SPEC	6.6 $p\bar{p} \rightarrow KK\pi X$

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

<u>VALUE</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●				
0.29 ± 0.10		ABELE	98E CBAR	0 $p\bar{p} \rightarrow \eta\pi^0\pi^0\pi^0$
0.19 ± 0.04	2200	22 ALDE	97B GAM4	100 $\pi^-p \rightarrow \eta\pi^0\pi^0n$
$0.56 \pm 0.04 \pm 0.03$		22 AMSLER	95F CBAR	0 $\bar{p}p \rightarrow \pi^+\pi^-\pi^0\pi^0\eta$

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

<u>VALUE</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●				
0.91 ± 0.12		ANISOVICH	01 SPEC	0.0 $\bar{p}p \rightarrow$ $\eta\pi^+\pi^-\pi^+\pi^-$
0.15 ± 0.04	9082	MANAK	00A MPS	18 $\pi^-p \rightarrow \eta\pi^+\pi^-n$
$0.70 \pm 0.12 \pm 0.20$		23 BAI	99 BES	$J/\psi \rightarrow \gamma\eta\pi^+\pi^-$

$\Gamma(\rho^0\gamma)/\Gamma(K\bar{K}\pi)$ Γ_8/Γ_1

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
0.0152 ± 0.0038	24 COFFMAN	90 MRK3	$J/\psi \rightarrow \gamma\gamma\pi^+\pi^-$

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

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

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

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
0.32 ± 0.07	25 ANISOVICH	99 SPEC	0.9–1.2 $\bar{p}p \rightarrow \eta 3\pi^0$

$\Gamma(K^*(892)K)/\Gamma(a_0(980)\pi)$ Γ_9/Γ_3

VALUE	DOCUMENT ID	TECN	COMMENT
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• • • We do not use the following data for averages, fits, limits, etc. • • •

0.084 ± 0.024	²⁶ ADAMS	01B E852	18 GeV $\pi^- p \rightarrow K^+ K^- \pi^0 n$
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²¹ Assuming that the $a_0(980)$ decays only into $K\bar{K}$.²² Assuming that the $a_0(980)$ decays only into $\eta\pi$.²³ Assuming that the $a_0(980)$ decays only into $\eta\pi$.²⁴ Using $B(J/\psi \rightarrow \gamma\eta(1405) \rightarrow \gamma K\bar{K}\pi) = 4.2 \times 10^{-3}$ and $B(J/\psi \rightarrow \gamma\eta(1405) \rightarrow \gamma\gamma\rho^0) = 6.4 \times 10^{-5}$ and assuming that the $\gamma\rho^0$ signal does not come from the $f_1(1420)$.²⁵ Using preliminary Crystal Barrel data.²⁶ Statistical error only. $\eta(1405)$ REFERENCES

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

OTHER RELATED PAPERS

FADDEEV	04	PR D70 114033	L. Faddeev <i>et al.</i>	
LI	03C	EPJ C28 335	D.M. Li <i>et al.</i>	
LI	03D	IJMP A18 3335	D.M. Li <i>et al.</i>	
ANISOVICH	00F	EPJ A6 247	A.V. Anisovich <i>et al.</i>	
CARVALHO	99	EPJ C7 95	W.S. Carvalho <i>et al.</i>	
NEKRASOV	98	EPJ C5 507	M.L. Nekrasov	
BERTIN	96	PL B385 493	A. Bertin <i>et al.</i>	(Obelix Collab.)
FARRAR	96	PRL 76 4111	G.R. Farrar	(RUTG)
AMELIN	95	ZPHY C66 71	D.V. Amelin <i>et al.</i>	(VES Collab.)

GENOVESE	94	ZPHY C61 425	M. Genovese, D.B. Lichtenberg, E. Predazzi	(TORI+)
BALI	93	PL B309 378	G.S. Bali <i>et al.</i>	(LIVP)
AHMAD	89	NP B (PROC.)8 50	S. Ahmad <i>et al.</i>	(ASTERIX Collab.)
ARMSTRONG	89	PL B221 216	T.A. Armstrong <i>et al.</i>	(CERN, CDEF, BIRM+)
ARMSTRONG	87	ZPHY C34 23	T.A. Armstrong <i>et al.</i>	(CERN, BIRM, BARI+)
ARMSTRONG	84	PL 146B 273	T.A. Armstrong <i>et al.</i>	(ATHU, BARI, BIRM+)
DIONISI	80	NP B169 1	C. Dionisi <i>et al.</i>	(CERN, MADR, CDEF+)
DEFOIX	72	NP B44 125	C. Defoix <i>et al.</i>	(CDEF, CERN)
DUBOC	72	NP B46 429	J. Duboc <i>et al.</i>	(PARIS, LIVP)
LORSTAD	69	NP B14 63	B. Lorstad <i>et al.</i>	(CDEF, CERN)
