

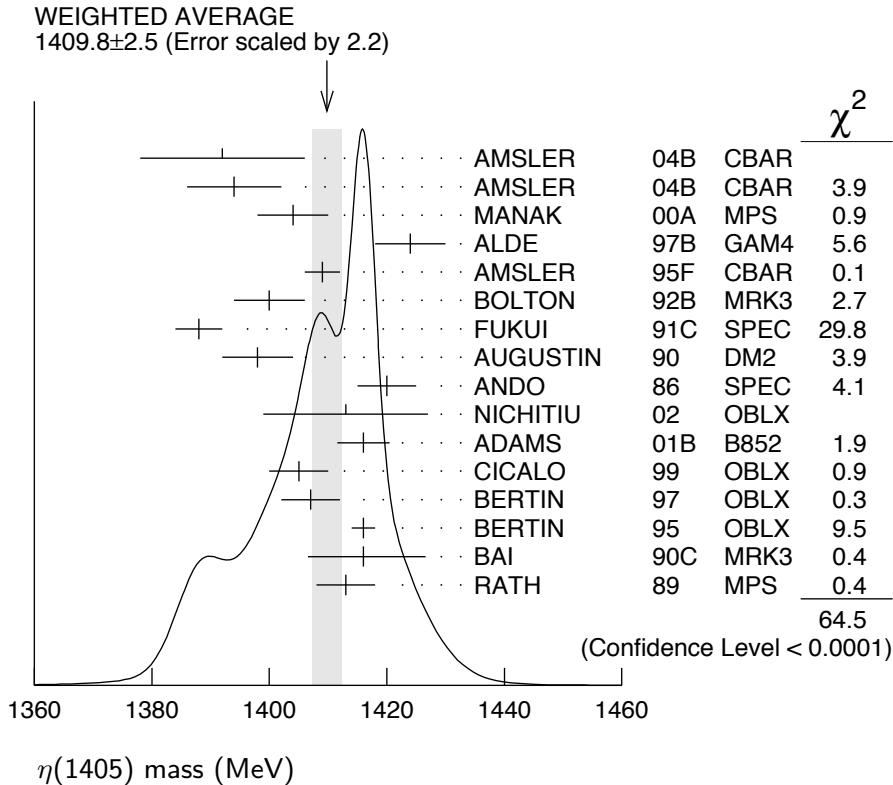
# $\eta(1405)$

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

A REVIEW GOES HERE – Check our WWW List of Reviews

## $\eta(1405)$ 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.



## $\eta\pi\pi$ 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.

1392±14	900 ± 375	AMSLER	04B	CBAR	0 $\bar{p}p \rightarrow \pi^+\pi^-\pi^+\pi^-\eta$
1394± 8	6.6 ± 2.0k	AMSLER	04B	CBAR	0 $\bar{p}p \rightarrow \pi^+\pi^-\pi^0\pi^0\eta$
1404± 6	9082	MANAK	00A	MPS	18 $\pi^-p \rightarrow \eta\pi^+\pi^-n$
1424± 6	2200	ALDE	97B	GAM4	100 $\pi^-p \rightarrow \eta\pi^0\pi^0n$
1409± 3		AMSLER	95F	CBAR	0 $\bar{p}p \rightarrow \pi^+\pi^-\pi^0\pi^0\eta$
1400± 6		<sup>1</sup> 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	<sup>2</sup> 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. ● ● ●

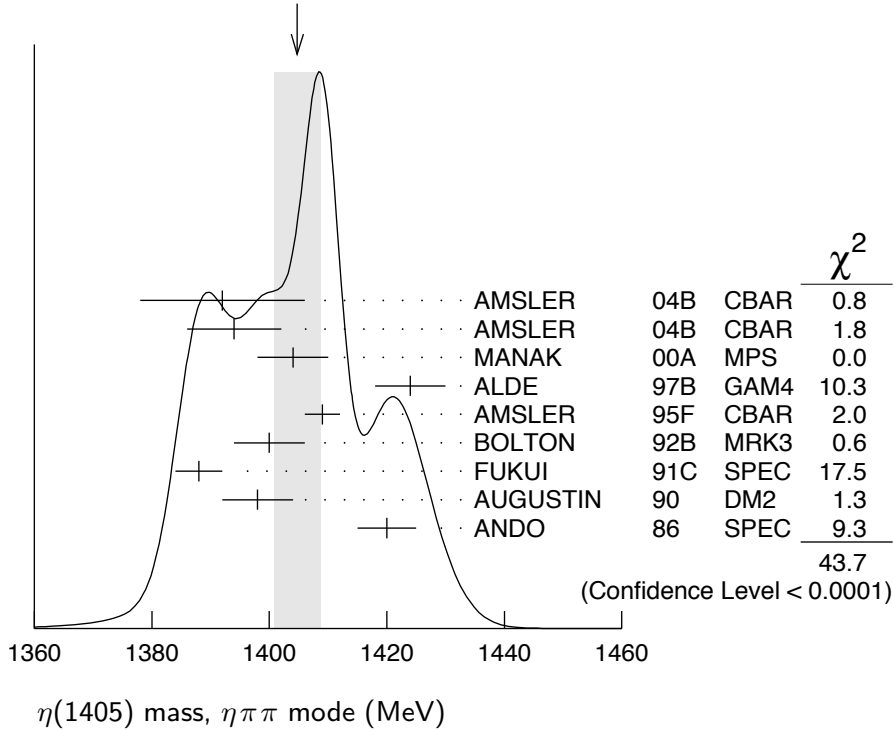
1385 ± 7

BAI

99 BES

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

WEIGHTED AVERAGE  
1405 ± 4 (Error scaled by 2.3)



### $K \bar{K} \pi$ 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	<sup>3</sup> NICHITIU	02	OBLX	
1416 ± 4 ± 2	20k	ADAMS	01B	B852	18 GeV $\pi^- p \rightarrow K^+ K^- \pi^0 n$
1405 ± 5		<sup>4</sup> CICALO	99	OBLX	$0 \bar{p} p \rightarrow K^\pm K_S^0 \pi^\mp \pi^+ \pi^-$
1407 ± 5		<sup>4</sup> BERTIN	97	OBLX	$0 \bar{p} p \rightarrow K^\pm (K^0) \pi^\mp \pi^+ \pi^-$
1416 ± 2		<sup>4</sup> BERTIN	95	OBLX	$0 \bar{p} p \rightarrow K \bar{K} \pi \pi \pi$
1416 ± 8 <sup>+7</sup> / <sub>-5</sub>	700	<sup>5</sup> BAI	90C	MRK3	$J/\psi \rightarrow \gamma K_S^0 K^\pm \pi^\mp$
1413 ± 5		<sup>5</sup> 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		<sup>6</sup> AUGUSTIN	92	DM2	$J/\psi \rightarrow \gamma K \bar{K} \pi$

### $\pi \pi \gamma$ MODE

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
<b>1390 ± 12</b>	235 ± 91	AMSLER	04B CBAR	$0 \bar{p} p \rightarrow \pi^+ \pi^- \pi^+ \pi^- \gamma$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●				
1424 ± 10 ± 11	547	BAI	04J BES2	$J/\psi \rightarrow \gamma \gamma \pi^+ \pi^-$
1401 ± 18		<sup>7,8</sup> AUGUSTIN	90 DM2	$J/\psi \rightarrow \pi^+ \pi^- \gamma \gamma$
1432 ± 8		<sup>8</sup> 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. ● ● ●				
1420 ± 20		BUGG	95 MRK3	$J/\psi \rightarrow \gamma \pi^+ \pi^- \pi^+ \pi^-$
1489 ± 12	3270	<sup>9</sup> 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. ● ● ●				
1437.6 ± 3.2	249 ± 35	<sup>10,11</sup> ABLIKIM	08E BES2	$J/\psi \rightarrow \omega K_S^0 K^+ \pi^- + \text{c.c.}$
1445.9 ± 5.7	62 ± 18	<sup>10,11</sup> ABLIKIM	08E BES2	$J/\psi \rightarrow \omega K^+ K^- \pi^0$
1442 ± 10	410	<sup>10</sup> BAI	98C BES	$J/\psi \rightarrow \gamma K^+ K^- \pi^0$
1445 ± 8	693	<sup>10</sup> AUGUSTIN	90 DM2	$J/\psi \rightarrow \gamma K_S^0 K^\pm \pi^\mp$
1433 ± 8	296	<sup>10</sup> AUGUSTIN	90 DM2	$J/\psi \rightarrow \gamma K^+ K^- \pi^0$
1413 ± 8	500	<sup>10</sup> DUCH	89 ASTE	$\bar{p}p \rightarrow \pi^+ \pi^- K^\pm \pi^\mp K^0$
1453 ± 7	170	<sup>10</sup> RATH	89 MPS	$21.4 \pi^- p \rightarrow K_S^0 K_S^0 \pi^0 n$
1419 ± 1	8800	<sup>10</sup> BIRMAN	88 MPS	$8 \pi^- p \rightarrow K^+ \bar{K}^0 \pi^- n$
1424 ± 3	620	<sup>10</sup> REEVES	86 SPEC	$6.6 p\bar{p} \rightarrow K \bar{K} \pi X$
1421 ± 2		<sup>10</sup> CHUNG	85 SPEC	$8 \pi^- p \rightarrow K \bar{K} \pi n$
1440 <sup>+20</sup> <sub>-15</sub>	174	<sup>10</sup> EDWARDS	82E CBAL	$J/\psi \rightarrow \gamma K^+ K^- \pi^0$
1440 <sup>+10</sup> <sub>-15</sub>		<sup>10</sup> SCHARRE	80 MRK2	$J/\psi \rightarrow \gamma K_S^0 K^\pm \pi^\mp$
1425 ± 7	800	<sup>10,12</sup> BAILLON	67 HBC	$0 \bar{p}p \rightarrow K \bar{K} \pi \pi \pi$

<sup>1</sup> From fit to the  $a_0(980)\pi 0^-+$  partial wave.

<sup>2</sup> Best fit with a single Breit Wigner.

<sup>3</sup> Decaying dominantly directly to  $K^+ K^- \pi^0$ .

<sup>4</sup> Decaying into  $(K\bar{K})_S \pi$ ,  $(K\pi)_S \bar{K}$ , and  $a_0(980)\pi$ .

<sup>5</sup> From fit to the  $a_0(980)\pi 0^-+$  partial wave. Cannot rule out a  $a_0(980)\pi 1^++$  partial wave.

<sup>6</sup> Excluded from averaging because averaging would be meaningless.

<sup>7</sup> Best fit with a single Breit Wigner.

<sup>8</sup> This peak in the  $\gamma\rho$  channel may not be related to the  $\eta(1405)$ .

<sup>9</sup> Estimated by us from various fits.

<sup>10</sup> These experiments identify only one pseudoscalar in the 1400–1500 range. Data could also refer to  $\eta(1475)$ .

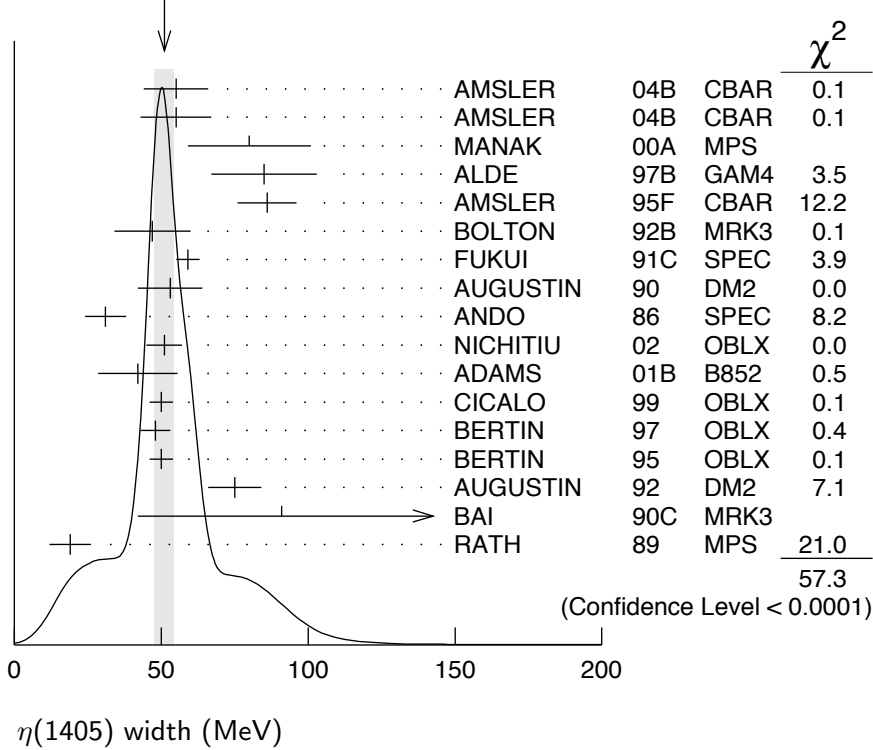
<sup>11</sup> Systematic uncertainty not evaluated.

<sup>12</sup> From best fit of  $0^-+$  partial wave, 50%  $K^*(892)K$ , 50%  $a_0(980)\pi$ .

### $\eta(1405)$ WIDTH

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

WEIGHTED AVERAGE  
 $51.1 \pm 3.4$  (Error scaled by 2.0)



### $\eta\pi\pi$ MODE

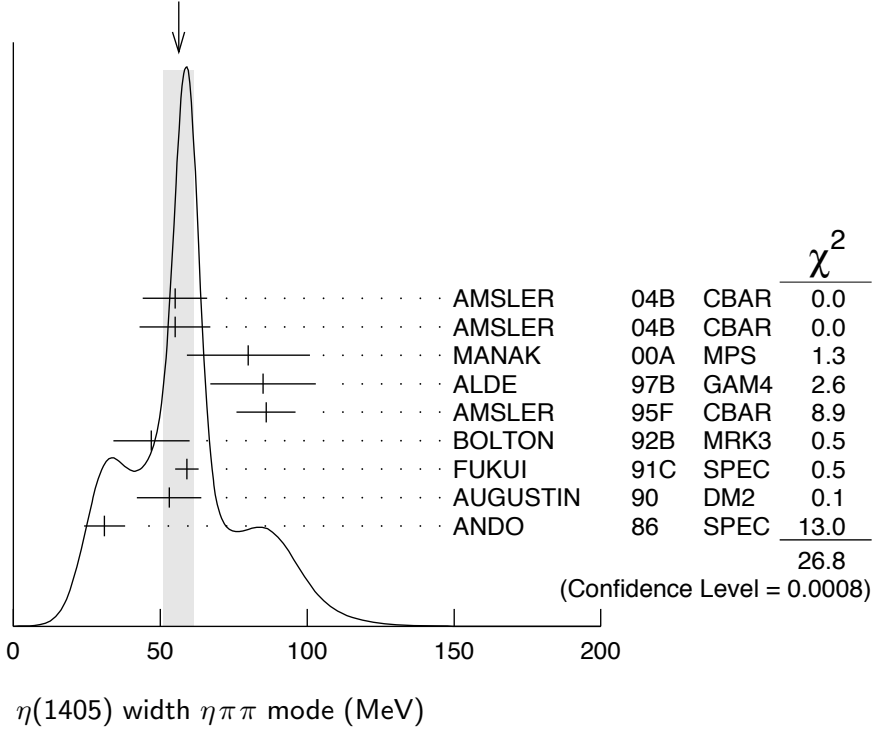
VALUE (MeV)      EVTS      DOCUMENT ID      TECN      COMMENT

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.

$55 \pm 11$	$900 \pm 375$	AMSLER	04B CBAR	$0 \bar{p}p \rightarrow \pi^+ \pi^- \pi^+ \pi^- \eta$
$55 \pm 12$	$6.6 \pm 2.0k$	AMSLER	04B CBAR	$0 \bar{p}p \rightarrow \pi^+ \pi^- \pi^0 \pi^0 \gamma$
$80 \pm 21$	9082	MANAK	00A MPS	$18 \pi^- p \rightarrow \eta \pi^+ \pi^- n$
$85 \pm 18$	2200	ALDE	97B GAM4	$100 \pi^- p \rightarrow \eta \pi^0 \pi^0 n$
$86 \pm 10$		AMSLER	95F CBAR	$0 \bar{p}p \rightarrow \pi^+ \pi^- \pi^0 \pi^0 \eta$
$47 \pm 13$		<sup>13</sup> BOLTON	92B MRK3	$J/\psi \rightarrow \gamma \eta \pi^+ \pi^-$
$59 \pm 4$		FUKUI	91C SPEC	$8.95 \pi^- p \rightarrow \eta \pi^+ \pi^- n$
$53 \pm 11$		<sup>14</sup> AUGUSTIN	90 DM2	$J/\psi \rightarrow \gamma \eta \pi^+ \pi^-$
$31 \pm 7$		ANDO	86 SPEC	$8 \pi^- p \rightarrow \eta \pi^+ \pi^- n$

WEIGHTED AVERAGE  
 $56 \pm 5$  (Error scaled by 1.8)

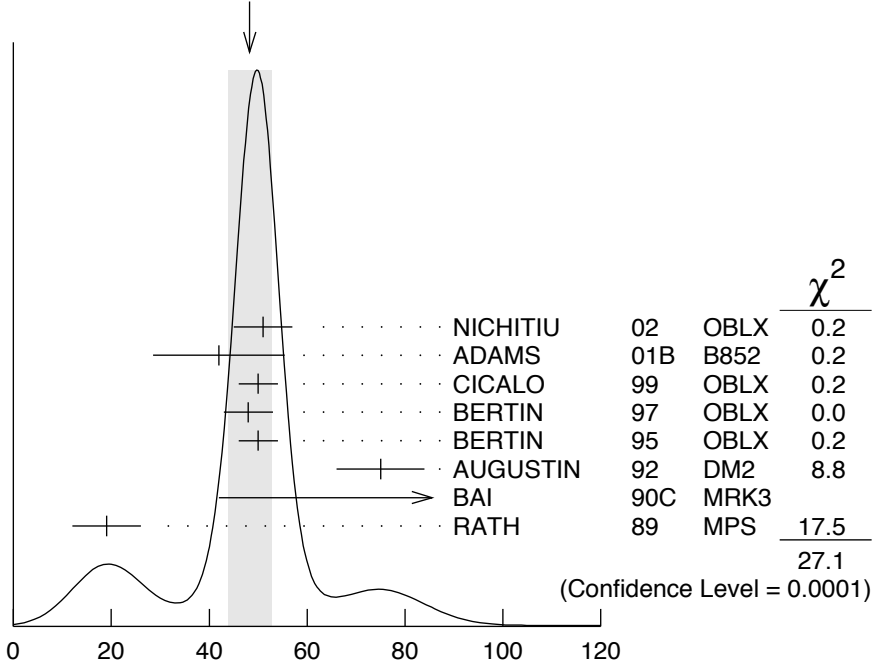


**$K\bar{K}\pi$  MODE ( $a_0(980)\pi$  or direct  $K\bar{K}\pi$ )**

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

<b><math>48 \pm 4</math> OUR AVERAGE</b>		Error includes scale factor of 2.1. See the ideogram below.			
$51 \pm 6$	3651	15 NICHITIU	02	OBLX	
$42 \pm 10 \pm 9$	20k	ADAMS	01B	B852	$18 \text{ GeV } \pi^- p \rightarrow K^+ K^- \pi^0 n$
$50 \pm 4$		CICALO	99	OBLX	$0 \bar{p} p \rightarrow K^\pm K_S^0 \pi^\mp \pi^+ \pi^-$
$48 \pm 5$		16 BERTIN	97	OBLX	$0.0 \bar{p} p \rightarrow K^\pm (K^0) \pi^\mp \pi^+ \pi^-$
$50 \pm 4$		16 BERTIN	95	OBLX	$0 \bar{p} p \rightarrow K\bar{K}\pi\pi\pi$
$75 \pm 9$		AUGUSTIN	92	DM2	$J/\psi \rightarrow \gamma K\bar{K}\pi$
$91^{+67}_{-31} \pm 15_{-38}$		17 BAI	90C	MRK3	$J/\psi \rightarrow \gamma K_S^0 K^\pm \pi^\mp$
$19 \pm 7$		17 RATH	89	MPS	$21.4 \pi^- p \rightarrow n K_S^0 K_S^0 \pi^0$

WEIGHTED AVERAGE  
 $48 \pm 4$  (Error scaled by 2.1)



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

### $\pi\pi\gamma$ MODE

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
<b>64 ± 18</b>	235 ± 91	AMSLER	04B CBAR	$0 \bar{p}p \rightarrow \pi^+\pi^-\pi^+\pi^-\gamma$
● ● ● 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		<sup>18</sup> COFFMAN	90 MRK3	$J/\psi \rightarrow \pi^+\pi^-2\gamma$

### $4\pi$ 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	<sup>19</sup> 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. ● ● ●				
48.9 ± 9.0	249 ± 35	<sup>20,21</sup> ABLIKIM	08E BES2	$J/\psi \rightarrow \omega K_S^0 K^+\pi^- + \text{c.c.}$
34.2 ± 18.5	62 ± 18	<sup>20,21</sup> ABLIKIM	08E BES2	$J/\psi \rightarrow \omega K^+ K^-\pi^0$
93 ± 14	296	<sup>20</sup> AUGUSTIN	90 DM2	$J/\psi \rightarrow \gamma K^+ K^-\pi^0$
105 ± 10	693	<sup>20</sup> AUGUSTIN	90 DM2	$J/\psi \rightarrow \gamma K_S^0 K^\pm \pi^\mp$
62 ± 16	500	<sup>20</sup> DUCH	89 ASTE	$\bar{p}p \rightarrow K\bar{K}\pi\pi$
100 ± 11	170	<sup>20</sup> RATH	89 MPS	21.4 $\pi^- p \rightarrow K_S^0 K_S^0 \pi^0 n$

66 ± 2	8800	20 BIRMAN	88	MPS	$8 \pi^- p \rightarrow K^+ \bar{K}^0 \pi^- n$
60 ± 10	620	20 REEVES	86	SPEC	$6.6 p \bar{p} \rightarrow K K \pi X$
60 ± 10		20 CHUNG	85	SPEC	$8 \pi^- p \rightarrow K \bar{K} \pi n$
55 $\begin{smallmatrix} +20 \\ -30 \end{smallmatrix}$	174	20 EDWARDS	82E	CBAL	$J/\psi \rightarrow \gamma K^+ K^- \pi^0$
50 $\begin{smallmatrix} +30 \\ -20 \end{smallmatrix}$		20 SCHARRE	80	MRK2	$J/\psi \rightarrow \gamma K_S^0 K^\pm \pi^\mp$
80 ± 10	800	20,22 BAILLON	67	HBC	$0.0 \bar{p} p \rightarrow K \bar{K} \pi \pi \pi$

<sup>13</sup> From fit to the  $a_0(980)\pi 0^-+$  partial wave.

<sup>14</sup> From  $\eta\pi^+\pi^-$  mass distribution - mainly  $a_0(980)\pi$  - no spin-parity determination available.

<sup>15</sup> Decaying dominantly directly to  $K^+K^-\pi^0$ .

<sup>16</sup> Decaying into  $(K\bar{K})_S\pi$ ,  $(K\pi)_S\bar{K}$ , and  $a_0(980)\pi$ .

<sup>17</sup> From fit to the  $a_0(980)\pi 0^-+$  partial wave, but  $a_0(980)\pi 1^{++}$  cannot be excluded.

<sup>18</sup> This peak in the  $\gamma\rho$  channel may not be related to the  $\eta(1405)$ .

<sup>19</sup> Estimated by us from various fits.

<sup>20</sup> These experiments identify only one pseudoscalar in the 1400–1500 range. Data could also refer to  $\eta(1475)$ .

<sup>21</sup> Systematic uncertainty not evaluated.

<sup>22</sup> From best fit to  $0^-+$  partial wave, 50%  $K^*(892)K$ , 50%  $a_0(980)\pi$ .

### $\eta(1405)$ DECAY MODES

Mode	Fraction ( $\Gamma_i/\Gamma$ )	Confidence level
$\Gamma_1$ $K\bar{K}\pi$	seen	
$\Gamma_2$ $\eta\pi\pi$	seen	
$\Gamma_3$ $a_0(980)\pi$	seen	
$\Gamma_4$ $\eta(\pi\pi)_S\text{-wave}$	seen	
$\Gamma_5$ $f_0(980)\eta$	seen	
$\Gamma_6$ $4\pi$	seen	
$\Gamma_7$ $\rho\rho$	<58 %	99.85%
$\Gamma_8$ $\gamma\gamma$		
$\Gamma_9$ $\rho^0\gamma$	seen	
$\Gamma_{10}$ $\phi\gamma$		
$\Gamma_{11}$ $K^*(892)K$	seen	

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

$\Gamma(K\bar{K}\pi) \times \Gamma(\gamma\gamma)/\Gamma_{\text{total}}$					$\Gamma_1\Gamma_8/\Gamma$
VALUE (keV)	CL%	DOCUMENT ID	TECN	COMMENT	

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

<0.035	90	23,24 AHOHE	05	CLE2	$10.6 e^+e^- \rightarrow e^+e^- K_S^0 K^\pm \pi^\mp$
--------	----	-------------	----	------	--

$\Gamma(\eta\pi\pi) \times \Gamma(\gamma\gamma)/\Gamma_{\text{total}}$					$\Gamma_2\Gamma_8/\Gamma$
VALUE (keV)	CL%	DOCUMENT ID	TECN	COMMENT	

<0.095	95	ACCIARRI	01G	L3	$183\text{--}202 e^+e^- \rightarrow e^+e^- \eta\pi^+\pi^-$
--------	----	----------	-----	----	--

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

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

<sup>23</sup> Using  $\eta(1405)$  mass and width 1410 MeV and 51 MeV, respectively.

<sup>24</sup> Assuming three-body phase-space decay to  $K_S^0 K^\pm \pi^\mp$ .

$\eta(1405)$  BRANCHING RATIOS

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

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
-------	-----	-------------	------	---------

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

$1.09 \pm 0.48$		<sup>25</sup> AMSLER	04B	CBAR $0 \bar{p}p \rightarrow \pi^+\pi^-\pi^+\pi^-\eta$
<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 $0.0 \bar{p}p$

$\Gamma(\rho^0\gamma)/\Gamma(\eta\pi\pi)$   $\Gamma_9/\Gamma_2$

VALUE	DOCUMENT ID	TECN	COMMENT
-------	-------------	------	---------

<b><math>0.111 \pm 0.064</math></b>	AMSLER	04B	CBAR $0 \bar{p}p$
-------------------------------------	--------	-----	-------------------

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

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
-------	------	-------------	------	---------

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

$\sim 0.15$		<sup>26</sup> BERTIN	95	OBLX $0 \bar{p}p \rightarrow K\bar{K}\pi\pi\pi$
$\sim 0.8$	500	<sup>26</sup> DUCH	89	ASTE $\bar{p}p \rightarrow \pi^+\pi^-K^\pm\pi^\mp K^0$
$\sim 0.75$		<sup>26</sup> REEVES	86	SPEC $6.6 p\bar{p} \rightarrow KK\pi X$

$\Gamma(a_0(980)\pi)/\Gamma(\eta\pi\pi)$   $\Gamma_3/\Gamma_2$

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
-------	------	-------------	------	---------

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

$0.29 \pm 0.10$		ABELE	98E	CBAR $0 p\bar{p} \rightarrow \eta\pi^0\pi^0\pi^0$
$0.19 \pm 0.04$	2200	<sup>27</sup> ALDE	97B	GAM4 $100 \pi^-p \rightarrow \eta\pi^0\pi^0n$
$0.56 \pm 0.04 \pm 0.03$		<sup>27</sup> AMSLER	95F	CBAR $0 \bar{p}p \rightarrow \pi^+\pi^-\pi^0\pi^0\eta$

$\Gamma(a_0(980)\pi)/\Gamma(\eta(\pi\pi)s\text{-wave})$   $\Gamma_3/\Gamma_4$

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
-------	------	-------------	------	---------

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

$0.91 \pm 0.12$		ANISOVICH	01	SPEC $0.0 \bar{p}p \rightarrow \eta\pi^+\pi^-\pi^+\pi^-$
$0.15 \pm 0.04$	9082	<sup>28</sup> MANAK	00A	MPS $18 \pi^-p \rightarrow \eta\pi^+\pi^-n$
$0.70 \pm 0.12 \pm 0.20$		<sup>29</sup> BAI	99	BES $J/\psi \rightarrow \gamma\eta\pi^+\pi^-$

$\Gamma(\rho^0\gamma)/\Gamma(K\bar{K}\pi)$   $\Gamma_9/\Gamma_1$

VALUE	DOCUMENT ID	TECN	COMMENT
-------	-------------	------	---------

<b><math>0.0152 \pm 0.0038</math></b>	<sup>30</sup> COFFMAN	90	MRK3 $J/\psi \rightarrow \gamma\gamma\pi^+\pi^-$
---------------------------------------	-----------------------	----	--



**$\Gamma(\eta(\pi\pi)_{S\text{-wave}})/\Gamma(\eta\pi\pi)$   $\Gamma_4/\Gamma_2$**

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  $\pi^- p \rightarrow \eta\pi^0\pi^0 n$

**$\Gamma(f_0(980)\eta)/\Gamma(\eta\pi\pi)$   $\Gamma_5/\Gamma_2$**

VALUE    DOCUMENT ID                      TECN                      COMMENT

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

0.32±0.07    <sup>31</sup> ANISOVICH                      00                      SPEC                      0.9–1.2  $\bar{p}p \rightarrow \eta 3\pi^0$

**$\Gamma(\rho\rho)/\Gamma_{\text{total}}$   $\Gamma_7/\Gamma$**

VALUE                      CL%                      DOCUMENT ID                      TECN                      COMMENT

<0.58                      99.85                      <sup>25,32</sup> AMSLER                      04B                      CBAR                      0  $\bar{p}p$

**$\Gamma(K^*(892)K)/\Gamma(a_0(980)\pi)$   $\Gamma_{11}/\Gamma_3$**

VALUE    DOCUMENT ID                      TECN                      COMMENT

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

0.084±0.024    <sup>28</sup> ADAMS                      01B                      B852                      18 GeV  $\pi^- p \rightarrow K^+ K^- \pi^0 n$

**$\Gamma(\phi\gamma)/\Gamma(\rho^0\gamma)$   $\Gamma_{10}/\Gamma_9$**

VALUE                      CL%                      DOCUMENT ID                      TECN                      COMMENT

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

<0.77                      95                      <sup>33</sup> BAI                      04J                      BES2                       $J/\psi \rightarrow \gamma\gamma K^+ K^-$

<sup>25</sup> Using the data of BAILLON 67 on  $\bar{p}p \rightarrow K\bar{K}\pi$ .

<sup>26</sup> Assuming that the  $a_0(980)$  decays only into  $K\bar{K}$ .

<sup>27</sup> Assuming that the  $a_0(980)$  decays only into  $\eta\pi$ .

<sup>28</sup> Statistical error only.

<sup>29</sup> Assuming that the  $a_0(980)$  decays only into  $\eta\pi$ .

<sup>30</sup> 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  $f_1(1420)$ .

<sup>31</sup> Using preliminary Crystal Barrel data.

<sup>32</sup> Assuming that the  $\eta(1405)$  decays are saturated by the  $\pi\pi\eta$ ,  $K\bar{K}\pi$  and  $\rho\rho$  modes.

<sup>33</sup> Calculated by us from  $B(J/\psi \rightarrow \eta(1405)\gamma \rightarrow \phi\gamma\gamma) < 0.82 \times 10^{-4}$  and  $B(J/\psi \rightarrow \eta(1405)\gamma \rightarrow \rho^0\gamma\gamma) = (1.07 \pm 0.17 \pm 0.11) \times 10^{-4}$ .

**$\eta(1405)$  REFERENCES**

ABLIKIM	08E	PR D77 032005	M. Ablikim <i>et al.</i>	(BES Collab.)
AHOHE	05	PR D71 072001	R. Ahohe <i>et al.</i>	(CLEO Collab.)
AMSLER	04B	EPJ C33 23	C. Amshler <i>et al.</i>	(Crystal Barrel Collab.)
BAI	04J	PL B594 47	J.Z. Bai <i>et al.</i>	(BES Collab.)
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>	
ANISOVICH	00	PL B472 168	A.V. Anisovich <i>et al.</i>	
MANAK	00A	PR D62 012003	J.J. Manak <i>et al.</i>	(BNL E852 Collab.)
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.)

Translated from YAF 60 458.

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		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)

---