

# η(1475)

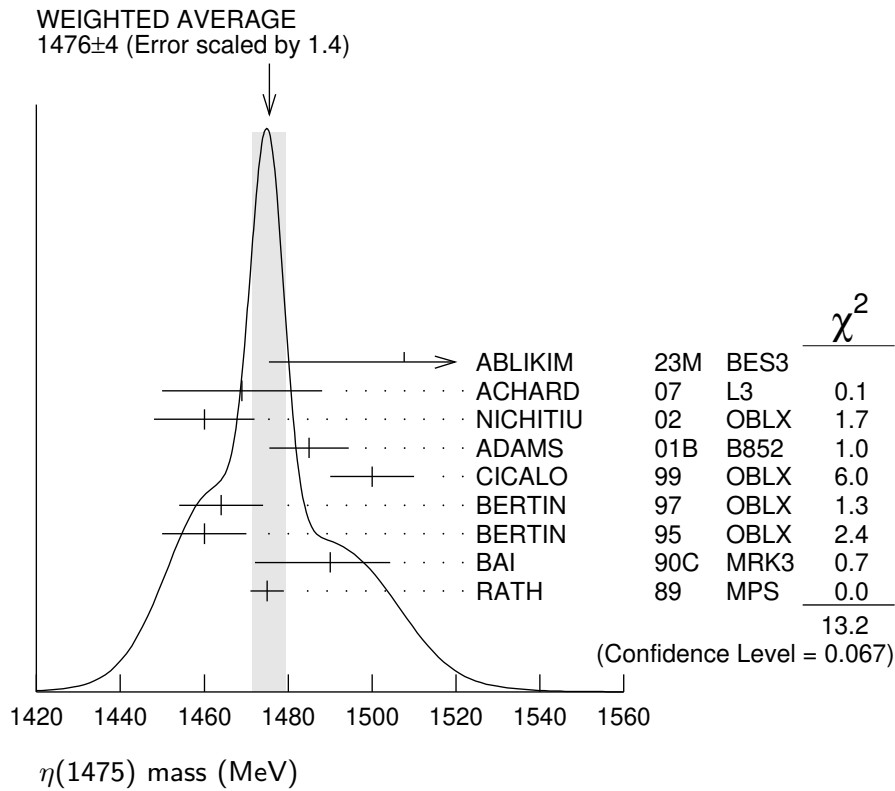
$$I^G(J^{PC}) = 0^+(0^{-+})$$

See the η(1405) and the related review on "Spectroscopy of Light Meson Resonances."

## η(1475) MASS

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
<b>1476 ± 4</b>	<b>OUR AVERAGE</b>	Error includes scale factor of 1.4. See the ideogram below.		
1507.6 ± 1.6 <sup>+15.5</sup> <sub>-32.2</sub>	126K	<sup>1</sup> ABLIKIM	23M BES3	$J/\psi \rightarrow \gamma K_S^0 K_S^0 \pi^0$
1469 ± 14 ± 13	74	ACHARD	07 L3	$183-209 e^+ e^- \rightarrow e^+ e^- K_S^0 K^\pm \pi^\mp$
1460 ± 12	3651	NICHITIU	02 OBLX	$0 \bar{p} p \rightarrow K^+ K^- \pi^+ \pi^- \pi^0$
1485 ± 8 ± 5	20k	ADAMS	01B B852	$18 \text{ GeV } \pi^- p \rightarrow K^+ K^- \pi^0 n$
1500 ± 10		CICALO	99 OBLX	$0 \bar{p} p \rightarrow K^\pm K_S^0 \pi^\mp \pi^+ \pi^-$
1464 ± 10		BERTIN	97 OBLX	$0 \bar{p} p \rightarrow K^\pm (K^0) \pi^\mp \pi^+ \pi^-$
1460 ± 10		BERTIN	95 OBLX	$0 \bar{p} p \rightarrow K \bar{K} \pi \pi$
1490 <sup>+14</sup> <sub>-8</sub> <sup>+3</sup> <sub>-16</sub>	1100	BAI	90C MRK3	$J/\psi \rightarrow \gamma K_S^0 K^\pm \pi^\mp$
1475 ± 4		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. ● ● ●				
1477 ± 7 ± 13		<sup>2</sup> ABLIKIM	18I BES3	$J/\psi \rightarrow \gamma \gamma \phi(1020)$
1565 ± 8 <sup>+0</sup> <sub>-63</sub>		<sup>3</sup> ABLIKIM	15T BES3	$J/\psi \rightarrow \gamma K_S^0 K_S^0 \eta$
1421 ± 14		AUGUSTIN	92 DM2	$J/\psi \rightarrow \gamma K \bar{K} \pi$

<sup>1</sup> ABLIKIM 23M reports for this state a significance from the fit much higher than 35 σ.  
<sup>2</sup> From a fit to γφ invariant mass. Angular analysis consistent with J<sup>PC</sup> = 0<sup>-+</sup>. Other J<sup>PC</sup> not excluded.  
<sup>3</sup> Could also be the η(1405).



### $\eta(1475)$ WIDTH

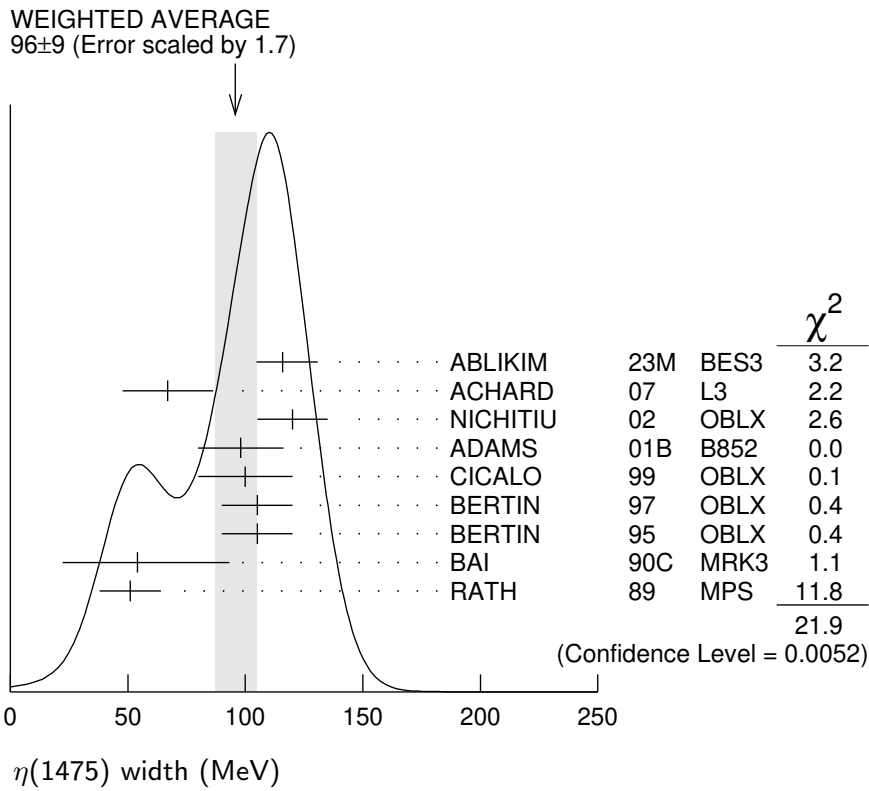
VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
<b>96 ± 9 OUR AVERAGE</b>		Error includes scale factor of 1.7. See the ideogram below.		
115.8 ± 2.4 <sup>+14.8</sup> <sub>-10.9</sub>	126K	ABLIKIM	23M BES3	$J/\psi \rightarrow \gamma K_S^0 K_S^0 \pi^0$
67 ± 18 ± 7	74	ACHARD	07 L3	$183-209 e^+ e^- \rightarrow e^+ e^- K_S^0 K^\pm \pi^\mp$
120 ± 15	3651	NICHITIU	02 OBLX	$0 \bar{p} p \rightarrow K^+ K^- \pi^+ \pi^- \pi^0$
98 ± 18 ± 3	20k	ADAMS	01B B852	$18 \text{ GeV } \pi^- p \rightarrow K^+ K^- \pi^0 n$
100 ± 20		CICALO	99 OBLX	$0 \bar{p} p \rightarrow K^\pm K_S^0 \pi^\mp \pi^+ \pi^-$
105 ± 15		BERTIN	97 OBLX	$0.0 \bar{p} p \rightarrow K^\pm (K^0) \pi^\mp \pi^+ \pi^-$
105 ± 15		BERTIN	95 OBLX	$0 \bar{p} p \rightarrow K \bar{K} \pi \pi$
54 <sup>+37</sup> <sub>-21</sub> <sup>+13</sup> <sub>-24</sub>		BAI	90C MRK3	$J/\psi \rightarrow \gamma K_S^0 K^\pm \pi^\mp$
51 ± 13		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. • • •

118 ± 22 ± 17	<sup>1</sup>	ABLIKIM	18i BES3	$J/\psi \rightarrow \gamma \gamma \phi(1020)$
45 <sup>+14</sup> <sub>-13</sub> <sup>+21</sup> <sub>-28</sub>	<sup>2</sup>	ABLIKIM	15T BES3	$J/\psi \rightarrow \gamma K_S^0 K_S^0 \eta$
63 ± 18		AUGUSTIN	92 DM2	$J/\psi \rightarrow \gamma K \bar{K} \pi$

<sup>1</sup> From a fit to  $\gamma \phi$  invariant mass. Angular analysis consistent with  $J^{PC} = 0^{-+}$ . Other  $J^{PC}$  not excluded.

<sup>2</sup> Could also be the  $\eta(1405)$ .



### $\eta(1475)$ DECAY MODES

Mode	Fraction ( $\Gamma_i/\Gamma$ )
$\Gamma_1$ $K\bar{K}\pi$	seen
$\Gamma_2$ $K\bar{K}^*(892) + \text{c.c.}$	seen
$\Gamma_3$ $a_0(980)\pi$	seen
$\Gamma_4$ $\gamma\gamma$	seen
$\Gamma_5$ $K_S^0 K_S^0 \eta$	possibly seen
$\Gamma_6$ $\gamma\phi(1020)$	possibly seen

### $\eta(1475)$ $\Gamma(i)\Gamma(\gamma\gamma)/\Gamma(\text{total})$

$\Gamma(K\bar{K}\pi) \times \Gamma(\gamma\gamma)/\Gamma_{\text{total}}$					$\Gamma_1\Gamma_4/\Gamma$
VALUE (keV)	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
<b>0.23±0.05±0.05</b>		74	<sup>1</sup> ACHARD	07 L3	183-209 $e^+e^- \rightarrow e^+e^- K_S^0 K^\pm \pi^\mp$

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

< 0.089	90		<sup>2,3</sup> AHOHE	05 CLE2	10.6 $e^+e^- \rightarrow e^+e^- K_S^0 K^\pm \pi^\mp$
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<sup>1</sup>Supersedes ACCIARRI 01G. Using  $B(K_S^0 \rightarrow \pi^+\pi^-) = 0.6895$ .

<sup>2</sup>Using  $\eta(1475)$  mass of 1481 MeV and width of 48 MeV. The upper limit increases to 0.140 keV if the world average value, 87 MeV, of the width is used.

<sup>3</sup>Assuming three-body phase-space decay to  $K_S^0 K^\pm \pi^\mp$ .

## $\eta(1475)$ BRANCHING RATIOS

### $\Gamma(K\bar{K}^*(892)+c.c.)/\Gamma(K\bar{K}\pi)$ $\Gamma_2/\Gamma_1$

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

0.50±0.10	<sup>1</sup> BAILLON	67	HBC 0.0 $\bar{p}p \rightarrow K\bar{K}\pi\pi\pi$
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<sup>1</sup>Data could also refer to  $\eta(1405)$ .

### $\Gamma(K\bar{K}^*(892)+c.c.)/[\Gamma(K\bar{K}^*(892)+c.c.)+\Gamma(a_0(980)\pi)]$ $\Gamma_2/(\Gamma_2+\Gamma_3)$

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

$<0.25$	90	EDWARDS	82E CBAL $J/\psi \rightarrow K^+K^-\pi^0\gamma$
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### $\Gamma(\gamma\gamma)/\Gamma(K\bar{K}\pi)$ $\Gamma_4/\Gamma_1$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
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$<1.27 \times 10^{-3}$	90	<sup>1</sup> ABLIKIM	180 BES3 $\psi(2S) \rightarrow \pi^+\pi^-\gamma\gamma$
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<sup>1</sup>Using results from BAI 00D.

### $\Gamma(\gamma\phi(1020))/\Gamma_{\text{total}}$ $\Gamma_6/\Gamma$

VALUE	DOCUMENT ID	TECN	COMMENT
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<b>possibly seen</b>	<sup>1</sup> ABLIKIM	18I	BES3 $J/\psi \rightarrow \gamma\gamma\phi(1020)$
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<sup>1</sup>Seen as a peak in  $\gamma\phi$  invariant mass. Angular analysis consistent with  $J^{PC} = 0^{-+}$ . Other  $J^{PC}$  not excluded. Also see  $\eta(1405)$ .

## $\eta(1475)$ REFERENCES

ABLIKIM	23M	JHEP 2303 121	M. Ablikim <i>et al.</i>	(BESIII Collab.)
ABLIKIM	18I	PR D97 051101	M. Ablikim <i>et al.</i>	(BESIII Collab.)
ABLIKIM	18O	PR D97 072014	M. Ablikim <i>et al.</i>	(BESIII Collab.)
ABLIKIM	15T	PRL 115 091803	M. Ablikim <i>et al.</i>	(BESIII Collab.)
ACHARD	07	JHEP 0703 018	P. Achard <i>et al.</i>	(L3 Collab.)
AHOHE	05	PR D71 072001	R. Ahohe <i>et al.</i>	(CLEO 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.)
BAI	00D	PL B476 25	J.Z. Bai <i>et al.</i>	(BES Collab.)
CICALO	99	PL B462 453	C. Cicalo <i>et al.</i>	(OBELIX Collab.)
BERTIN	97	PL B400 226	A. Bertin <i>et al.</i>	(OBELIX Collab.)
BERTIN	95	PL B361 187	A. Bertin <i>et al.</i>	(OBELIX Collab.)
AUGUSTIN	92	PR D46 1951	J.E. Augustin, G. Cosme	(DM2 Collab.)
BAI	90C	PRL 65 2507	Z. Bai <i>et al.</i>	(Mark III Collab.)
RATH	89	PR D40 693	M.G. Rath <i>et al.</i>	(NDAM, BRAN, BNL, CUNY+)
EDWARDS	82E	PRL 49 259	C. Edwards <i>et al.</i>	(CIT, HARV, PRIN+)
BAILLON	67	NC 50A 393	P.H. Baillon <i>et al.</i>	(CERN, CDEF, IRAD)