

$\eta(1475)$

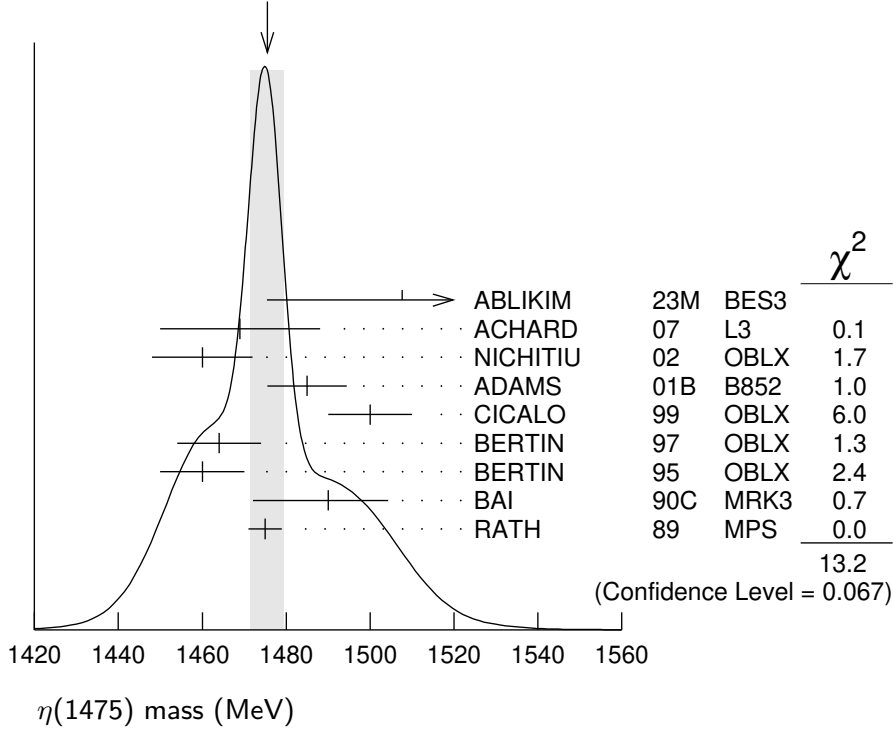
$$I^G(J^{PC}) = 0^+(0^{-+})$$

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

$\eta(1475)$ MASS

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
1476 ± 4	OUR AVERAGE	Error includes scale factor of 1.4. See the ideogram below.		
1507.6 ± 1.6 ^{+15.5} _{-32.2}	126k	¹ 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	$0 \bar{p} p \rightarrow K \bar{K} \pi \pi \pi$
1490 ⁺¹⁴ ₋₈ ⁺³ ₋₁₆	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		² ABLIKIM	18I BES3	$J/\psi \rightarrow \gamma \gamma \phi(1020)$
1565 ± 8 ⁺⁰ ₋₆₃		³ ABLIKIM	15T BES3	$J/\psi \rightarrow \gamma K_S^0 K_S^0 \eta$
1421 ± 14		AUGUSTIN	92 DM2	$J/\psi \rightarrow \gamma K \bar{K} \pi$

WEIGHTED AVERAGE
1476±4 (Error scaled by 1.4)



- ¹ ABLIKIM 23M reports for this state a significance from the fit much higher than 35σ .
² From a fit to $\gamma\phi$ invariant mass. Angular analysis consistent with $J^{PC} = 0^{-+}$. Other J^{PC} not excluded.
³ Could also be the $\eta(1405)$.

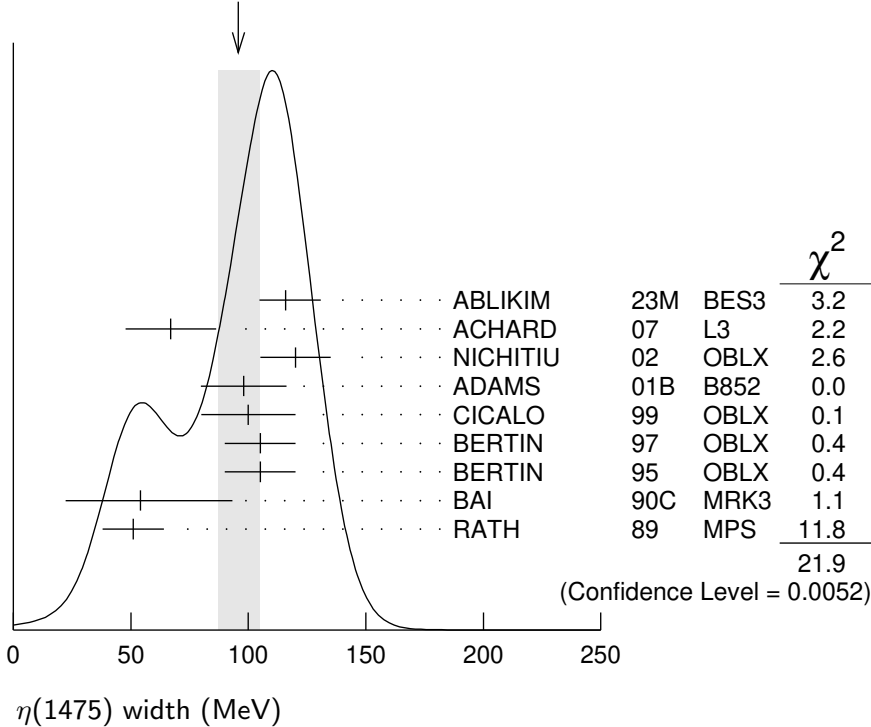
$\eta(1475)$ WIDTH

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
96 ± 9 OUR AVERAGE		Error includes scale factor of 1.7. See the ideogram below.		
115.8 ± 2.4 ^{+14.8} _{-10.9}	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 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 ⁺³⁷ ₋₂₁ ⁺¹³ ₋₂₄		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	¹ ABLIKIM 18I	BES3	$J/\psi \rightarrow \gamma \gamma \phi(1020)$
45 ⁺¹⁴ ₋₁₃ ⁺²¹ ₋₂₈	² ABLIKIM 15T	BES3	$J/\psi \rightarrow \gamma K_S^0 K_S^0 \eta$
63 ± 18	AUGUSTIN 92	DM2	$J/\psi \rightarrow \gamma K \bar{K} \pi$

WEIGHTED AVERAGE
 96±9 (Error scaled by 1.7)



¹ From a fit to $\gamma\phi$ invariant mass. Angular analysis consistent with $J^{PC} = 0^{-+}$. Other J^{PC} not excluded.
² Could also be the $\eta(1405)$.

$\eta(1475)$ DECAY MODES

Mode	Fraction (Γ_i/Γ)
Γ_1 $K\bar{K}\pi$	seen
Γ_2 $K\bar{K}^*(892) + \text{c.c.}$	seen
Γ_3 $a_0(980)\pi$	seen
Γ_4 $\gamma\gamma$	seen
Γ_5 $K_S^0 K_S^0 \eta$	possibly seen
Γ_6 $\gamma\phi(1020)$	possibly seen

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

$\Gamma(K\bar{K}\pi) \times \Gamma(\gamma\gamma)/\Gamma_{\text{total}}$					$\Gamma_1\Gamma_4/\Gamma$
<u>VALUE (keV)</u>	<u>CL%</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
0.23±0.05±0.05	74	¹	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	^{2,3}	AHOHE	05 CLE2	10.6 $e^+e^- \rightarrow e^+e^- K_S^0 K^\pm \pi^\mp$

¹ Supersedes ACCIARRI 01G. Using $B(K_S^0 \rightarrow \pi^+\pi^-) = 0.6895$.

² 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.

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

$\eta(1475)$ BRANCHING RATIOS

$\Gamma(K\bar{K}^*(892) + \text{c.c.})/\Gamma(K\bar{K}\pi)$					Γ_2/Γ_1
<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. • • •					
0.50±0.10	¹ BAILLON	67 HBC	0.0 $\bar{p}p \rightarrow K\bar{K}\pi\pi\pi$		

¹ Data could also refer to $\eta(1405)$.

$\Gamma(K\bar{K}^*(892) + \text{c.c.})/[\Gamma(K\bar{K}^*(892) + \text{c.c.}) + \Gamma(a_0(980)\pi)]$					$\Gamma_2/(\Gamma_2+\Gamma_3)$
<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. • • •					
< 0.25	90	EDWARDS	82E CBAL	$J/\psi \rightarrow K^+ K^- \pi^0 \gamma$	

$\Gamma(\gamma\gamma)/\Gamma(K\bar{K}\pi)$					Γ_4/Γ_1
<u>VALUE</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
< 1.27 × 10⁻³	90	¹ ABLIKIM	180 BES3	$\psi(2S) \rightarrow \pi^+\pi^-\gamma\gamma\gamma$	

¹ Using results from BAI 00D.

$\Gamma(\gamma\phi(1020))/\Gamma_{\text{total}}$ Γ_6/Γ

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
possibly seen	¹ ABLIKIM	18I	BES3 $J/\psi \rightarrow \gamma\gamma\phi(1020)$

¹ 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)