

$\eta(1475)$

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

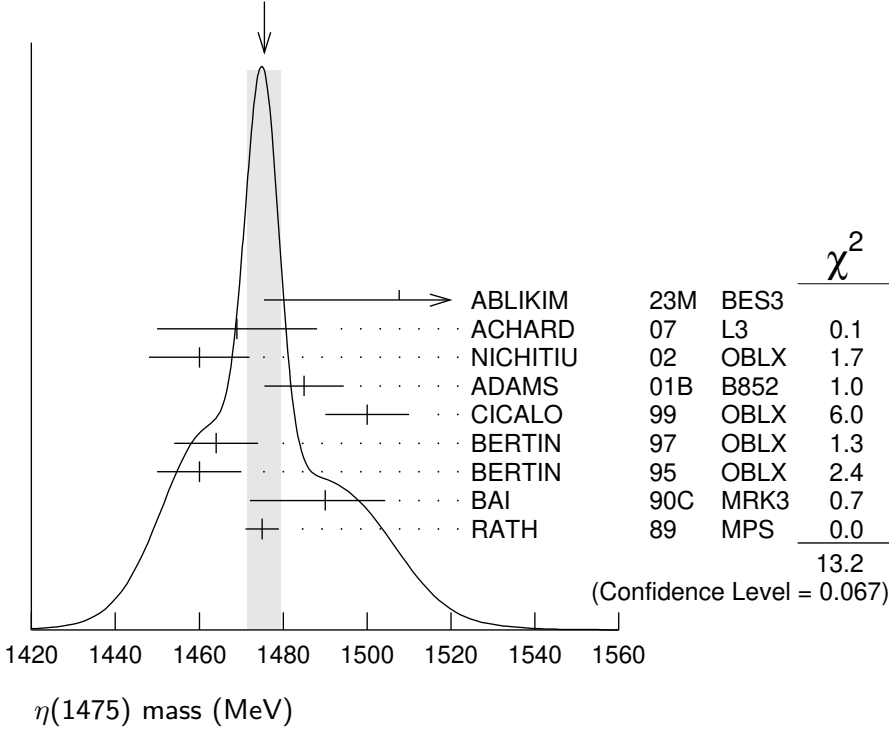
See the $\eta(1405)$ and the related review on "Spectroscopy of Light Meson Resonances."

$\eta(1475)$ 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	$183\text{--}209\text{ e}^+ \text{e}^- \rightarrow \text{e}^+ \text{e}^- K_S^0 K^\pm \pi^\mp$
1460 ± 12	3651	NICHITIU	02 OBLX	$0\text{ } \bar{p} p \rightarrow K^+ K^- \pi^+ \pi^- \pi^0$
1485 ± 8 ± 5	20k	ADAMS	01B B852	$18\text{ GeV } \pi^- p \rightarrow K^+ K^- \pi^0 n$
1500 ± 10		CICALO	99 OBLX	$0\text{ } \bar{p} p \rightarrow K^\pm K_S^0 \pi^\mp \pi^+ \pi^-$
1464 ± 10		BERTIN	97 OBLX	$0\text{ } \bar{p} p \rightarrow K^\pm (K^0) \pi^\mp \pi^+ \pi^-$
1460 ± 10		BERTIN	95 OBLX	$0\text{ } \bar{p} p \rightarrow K \bar{K} \pi \pi \pi$
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	$21.4\text{ } \pi^- p \rightarrow n K_S^0 K_S^0 \pi^0$
• • • 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	$J/\psi \rightarrow \gamma K \bar{K} \pi$

¹ ABLIKIM 23M reports for this state a significance from the fit much higher than 35 σ .
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 $\eta(1405)$.

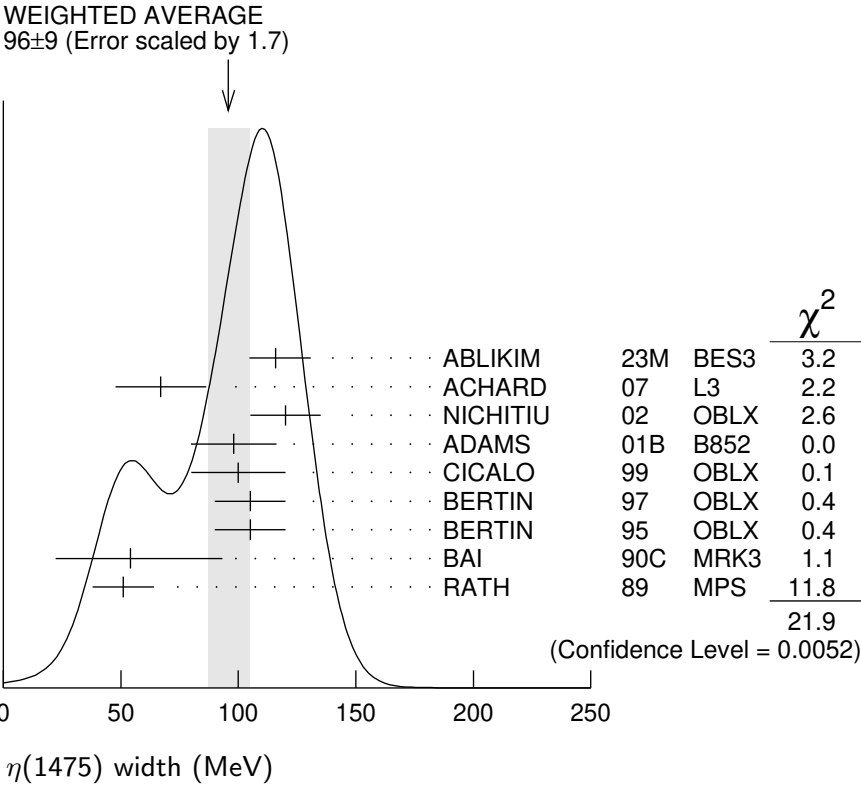
WEIGHTED AVERAGE
1476±4 (Error scaled by 1.4)



η(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	$18 \text{ GeV } \pi^- p \rightarrow K^+ K^- \pi^0 n$
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	$0 \bar{p} p \rightarrow K \bar{K} \pi \pi \pi$
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	$J/\psi \rightarrow \gamma K \bar{K} \pi$

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

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

$\Gamma(K \bar{K} \pi) \times \Gamma(\gamma\gamma)/\Gamma_{\text{total}}$			$\Gamma_1 \Gamma_4/\Gamma$		
VALUE (keV)	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
$0.23 \pm 0.05 \pm 0.05$		74	¹ ACHARD 07	L3	183–209 $e^+ e^- \rightarrow e^+ e^- K_S^0 K^\pm \pi^\mp$
< 0.089	90		^{2,3} AHOHE 05	CLE2	10.6 $e^+ e^- \rightarrow e^+ e^- K_S^0 K^\pm \pi^\mp$

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

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**

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	¹ BAILLON	67	HBC	$0.0 \bar{p}p \rightarrow K\bar{K}\pi\pi\pi$
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¹Data could also refer to $\eta(1405)$. **$\Gamma(K\bar{K}^*(892)+\text{c.c.})/[\Gamma(K\bar{K}^*(892)+\text{c.c.})+\Gamma(a_0(980)\pi)]$ $\Gamma_2/(\Gamma_2+\Gamma_3)$**

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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 $\Gamma(\gamma\gamma)/\Gamma(K\bar{K}\pi)$ Γ_4/Γ_1

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
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$<1.27 \times 10^{-3}$	90	¹ ABLIKIM	180	BES3 $\psi(2S) \rightarrow \pi^+\pi^-\gamma\gamma$
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¹Using results from BAI 00D. **$\Gamma(\gamma\phi(1020))/\Gamma_{\text{total}}$ Γ_6/Γ**

VALUE	DOCUMENT ID	TECN	COMMENT
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possibly seen	¹ ABLIKIM	181	BES3 $J/\psi \rightarrow \gamma\gamma\phi(1020)$
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¹Seen 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	181	PR D97 051101	M. Ablikim <i>et al.</i>	(BESIII Collab.)
ABLIKIM	180	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)