NODE=M147

$f_0(1370)$

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

NODE=M147

See the review on "Spectroscopy of Light Meson Resonances" and a note on "Non-$q\overline{q}$ Candidates" in PDG 06, Journal of Physics **G33** 1 (2006).

f_0(1370) T-MATRIX POLE $\sqrt{s}$

NODE=M147PP

Note that $\Gamma = -2\ \mathrm{Im}(\sqrt{s})$.

NODE=M147PP

NODE=M147PP

VALUE (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*	
(1250–1440) $-i$ (60–300) OUR ESTIMATE					→ UNCHECKED ←
$(1245 \pm 40)-i(300^{+30}_{-70})$	[1] PELAEZ	23	RVUE	Compilation	
$(1380^{+70}_{-60})-i(220^{+80}_{-70})$	[2] PELAEZ	23	RVUE	Compilation	OCCUR=2
$(1370 \pm 40)-i(195 \pm 20)$	SARANTSEV	21	RVUE	$J/\psi(1S) \to \gamma\ (\pi\pi, K\overline{K}, \eta\eta, \omega\phi)$	
$(1280.6 \pm 1.6 \pm 47.4) - i(205.2 \pm 1.7 \pm 20.7)$	[3] ALBRECHT	20	RVUE	0.9 $\overline{p}p \to \pi^0\pi^0\eta, \pi^0\eta\eta, \pi^0K^+K^-$	OCCUR=2
$(1290 \pm 50)-i(170^{+20}_{-40})$	[4] ANISOVICH	09	RVUE	0.0 $\overline{p}p$, πN	
$(1373 \pm 15)-i(137 \pm 10)$	[5] BARGIOTTI	03	OBLX	$\overline{p}p$	
$(1302 \pm 17)-i(166 \pm 18)$	[6] BARBERIS	00C		450 $pp \to p_f 4\pi p_s$	
$(1312 \pm 25 \pm 10)-i(109 \pm 22 \pm 15)$	BARBERIS	99D	OMEG	450 $pp \to K^+K^-, \pi^+\pi^-$	
$(1406 \pm 19)-i(80 \pm 6)$	[7] KAMINSKI	99	RVUE	$\pi\pi \to \pi\pi, K\overline{K}, \sigma\sigma$	OCCUR=2
$(1300 \pm 20)-i(120 \pm 20)$	ANISOVICH	98B	RVUE	Compilation	
$(1290 \pm 15)-i(145 \pm 15)$	BARBERIS	97B	OMEG	450 $pp \to pp2(\pi^+\pi^-)$	
$(1548 \pm 40)-i(560 \pm 40)$	BERTIN	97C	OBLX	0.0 $\overline{p}p \to \pi^+\pi^-\pi^0$	
$(1380 \pm 40)-i(180 \pm 25)$	ABELE	96B	CBAR	0.0 $\overline{p}p \to \pi^0 K^0_L K^0_L$	
$(1300 \pm 15)-i(115 \pm 8)$	BUGG	96	RVUE		
$(1330 \pm 50)-i(150 \pm 40)$	[8] AMSLER	95B	CBAR	$\overline{p}p \to 3\pi^0$	
$(1360 \pm 35)-i(150–300)$	[8] AMSLER	95C	CBAR	$\overline{p}p \to \pi^0\eta\eta$	
$(1390 \pm 30)-i(190 \pm 40)$	[9] AMSLER	95D	CBAR	$\overline{p}p \to 3\pi^0, \pi^0\eta\eta, \pi^0\pi^0\eta$	OCCUR=2
$1346 - i249$	[10,11] JANSSEN	95	RVUE	$\pi\pi \to \pi\pi, K\overline{K}$	OCCUR=2
$1214 - i168$	[11,12] TORNQVIST	95	RVUE	$\pi\pi \to \pi\pi, K\overline{K}, K\pi, \eta\pi$	
$1364 - i139$	AMSLER	94D	CBAR	$\overline{p}p \to \pi^0\pi^0\eta$	
$(1365^{+20}_{-55})-i(134 \pm 35)$	ANISOVICH	94	CBAR	$\overline{p}p \to 3\pi^0, \pi^0\eta\eta$	
$(1340 \pm 40)-i(127^{+30}_{-20})$	[13] BUGG	94	RVUE	$\overline{p}p \to 3\pi^0, \eta\eta\pi^0, \eta\pi^0\pi^0$	OCCUR=2
$(1430 \pm 5)-i(73 \pm 13)$	[14] KAMINSKI	94	RVUE	$\pi\pi \to \pi\pi, K\overline{K}$	
$1420 - i220$	[15] AU	87	RVUE	$\pi\pi \to \pi\pi, K\overline{K}$	

[1] From forward dispersion relation applied to $\pi\pi$ scattering data. NODE=M147PP;LINKAGE=G

[2] From partial-wave dispersion relation applied to $\pi\pi \to \overline{K}K$ data. NODE=M147PP;LINKAGE=I

[3] T-matrix pole, 5 poles, 5 channels, including scattering data from HYAMS 75 ($\pi\pi$), LONGACRE 86 ($K\overline{K}$), BINON 83 ($\eta\eta$), and BINON 84C ($\eta\eta'$). NODE=M147PP;LINKAGE=E

[4] Another pole is found at $(1510 \pm 130) - i\ (800^{+100}_{-150})$ MeV. NODE=M147PP;LINKAGE=AO

[5] Coupled channel analysis of $\pi^+\pi^-\pi^0$, $K^+K^-\pi^0$, and $K^\pm K^0_S\pi^\mp$. NODE=M147PP;LINKAGE=BG

[6] Average between $\pi^+\pi^-2\pi^0$ and $2(\pi^+\pi^-)$. NODE=M147PP;LINKAGE=PC

[7] T-matrix pole on sheet $---$. NODE=M147PP;LINKAGE=TK

[8] Supersedes ANISOVICH 94. NODE=M147PP;LINKAGE=K

[9] Coupled-channel analysis of $\overline{p}p \to 3\pi^0$, $\pi^0\eta\eta$, and $\pi^0\pi^0\eta$ on sheet IV. Demonstrates explicitly that $f_0(500)$ and $f_0(1370)$ are two different poles. NODE=M147PP;LINKAGE=A

[10] Analysis of data from FALVARD 88. NODE=M147PP;LINKAGE=C

[11] The pole is on Sheet III. Demonstrates explicitly that $f_0(500)$ and $f_0(1370)$ are two different poles. NODE=M147PP;LINKAGE=DD

[12] Uses data from BEIER 72B, OCHS 73, HYAMS 73, GRAYER 74, ROSSELET 77, CASON 83, ASTON 88, and ARMSTRONG 91B. Coupled channel analysis with flavor symmetry and all light two-pseudoscalars systems. NODE=M147PP;LINKAGE=BB

[13] Reanalysis of ANISOVICH 94 data. NODE=M147PP;LINKAGE=C1

[14] T-matrix pole on sheet III. NODE=M147PP;LINKAGE=KM

[15] Analysis of data from OCHS 73,GRAYER 74, BECKER 79, and CASON 83. NODE=M147PP;LINKAGE=H

f_0(1370) BREIT-WIGNER MASS

NODE=M147205

VALUE (MeV)	DOCUMENT ID
1200 to 1500 OUR ESTIMATE	

NODE=M147M
→ UNCHECKED ←

$\pi\pi$ MODE

NODE=M147M1

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
1400 ± 40		[1] AUBERT	09L	BABR	$B^{\pm} \to \pi^{\pm}\pi^{\pm}\pi^{\mp}$
1470^{+6+72}_{-7-255}		[2] UEHARA	08A	BELL	10.6 $e^+e^- \to e^+e^-\pi^0\pi^0$
1259 ± 55	2.6k	BONVICINI	07	CLEO	$D^+ \to \pi^-\pi^+\pi^+$
$1309\pm1\pm15$		[3] BUGG	07A	RVUE	0.0 $p\overline{p} \to 3\pi^0$
1449 ± 13	4.3k	[4] GARMASH	06	BELL	$B^+ \to K^+\pi^+\pi^-$
1350 ± 50		ABLIKIM	05	BES2	$J/\psi \to \phi\pi^+\pi^-$
$1265\pm30^{+20}_{-35}$		ABLIKIM	05Q	BES2	$\psi(2S) \to \gamma\pi^+\pi^-K^+K^-$
$1434\pm18\pm9$	848	AITALA	01A	E791	$D_s^+ \to \pi^-\pi^+\pi^+$
1308 ± 10		BARBERIS	99B	OMEG	450 $pp \to p_s p_f \pi^+\pi^-$
1315 ± 50		BELLAZZINI	99	GAM4	450 $pp \to pp\pi^0\pi^0$
1315 ± 30		ALDE	98	GAM4	100 $\pi^-p \to \pi^0\pi^0 n$
1280 ± 55		BERTIN	98	OBLX	0.05–0.405 $\overline{n}p \to \pi^+\pi^+\pi^-$
1186		[5,6] TORNQVIST	95	RVUE	$\pi\pi \to \pi\pi$, $K\overline{K}$, $K\pi$, $\eta\pi$
1472 ± 12		ARMSTRONG	91	OMEG	300 $pp \to pp\pi\pi$, $ppK\overline{K}$
1275 ± 20		BREAKSTONE	90	SFM	62 $pp \to pp\pi^+\pi^-$
1420 ± 20		AKESSON	86	SPEC	63 $pp \to pp\pi^+\pi^-$
1256		FROGGATT	77	RVUE	$\pi^+\pi^-$ channel

[1] Breit-Wigner mass. NODE=M147M1;LINKAGE=BW

[2] Breit-Wigner mass. May also be the f_0(1500). NODE=M147M1;LINKAGE=UE

[3] Reanalysis of ABELE 96C data. NODE=M147M1;LINKAGE=BU

[4] Also observed by GARMASH 07 in $B^0 \to K_S^0\pi^+\pi^-$ decays. Supersedes GARMASH 05. NODE=M147M1;LINKAGE=GR

[5] Uses data from BEIER 72B, OCHS 73, HYAMS 73, GRAYER 74, ROSSELET 77, CASON 83, ASTON 88, and ARMSTRONG 91B. Coupled channel analysis with flavor symmetry and all light two-pseudoscalars systems. NODE=M147M1;LINKAGE=BB

[6] Also observed by ASNER 00 in $\tau^- \to \pi^-\pi^0\pi^0\nu_\tau$ decays NODE=M147M1;LINKAGE=FF

$K\overline{K}$ MODE

NODE=M147M2

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$1422\pm15\pm28$		[1] AAIJ	19H	LHCB	$pp \to D^{\pm}X$
$1360\pm31\pm28$	430	[2,3] DOBBS	15		$J/\psi \to \gamma K^+K^-$
$1350\pm48\pm15$	168	[2,3] DOBBS	15		$\psi(2S) \to \gamma K^+K^-$
1440 ± 6		VLADIMIRSK...	06	SPEC	40 $\pi^-p \to K_S^0K_S^0 n$
1391 ± 10		TIKHOMIROV	03	SPEC	40.0 π^-C $\to K_S^0K_S^0K_L^0$X
1440 ± 50		BOLONKIN	88	SPEC	40 $\pi^-p \to K_S^0K_S^0 n$
1463 ± 9		ETKIN	82B	MPS	23 $\pi^-p \to n2K_S^0$
1425 ± 15		WICKLUND	80	SPEC	6 $\pi N \to K^+K^-N$
~1300		POLYCHRO...	79	STRC	7 $\pi^-p \to n2K_S^0$

OCCUR=4

OCCUR=2

[1] From the $D^{\pm} \to K^{\pm}K^+K^-$ Dalitz plot fit with the isobar model A. NODE=M147M2;LINKAGE=F

[2] Using CLEO-c data but not authored by the CLEO Collaboration. NODE=M147M2;LINKAGE=A

[3] From a fit to a Breit-Wigner line shape with fixed Γ = 346 MeV. NODE=M147M2;LINKAGE=B

4π MODE $2(\pi\pi)_S+\rho\rho$

NODE=M147M3

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
1395 ± 40		ABELE	01	CBAR	0.0 $\overline{p}d \to \pi^-4\pi^0 p$
1374 ± 38		AMSLER	94	CBAR	0.0 $\overline{p}p \to \pi^+\pi^-3\pi^0$
1345 ± 12		ADAMO	93	OBLX	$\overline{n}p \to 3\pi^+2\pi^-$
1386 ± 30		GASPERO	93	DBC	0.0 $\overline{p}n \to 2\pi^+3\pi^-$
~1410	5751	[1] BETTINI	66	DBC	0.0 $\overline{p}n \to 2\pi^+3\pi^-$

[1] $\rho\rho$ dominant. NODE=M147M3;LINKAGE=BE

$\eta\eta$ MODE

NODE=M147M4
NODE=M147M4

VALUE (MeV)	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$1262^{+51}_{-78}{}^{+\ 82}_{-103}$	[1] UEHARA	10A	BELL	10.6 $e^+e^- \rightarrow e^+e^-\eta\eta$
1430	AMSLER	92	CBAR	0.0 $\overline{p}p \rightarrow \pi^0\eta\eta$
1220 ± 40	ALDE	86D	GAM4	100 $\pi^- p \rightarrow n2\eta$

[1] Breit-Wigner mass. May also be the $f_0(1500)$. NODE=M147M4;LINKAGE=UE

COUPLED CHANNEL MODE

NODE=M147M5
NODE=M147M5

VALUE (MeV)	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$1330.2^{+\ 5.9}_{-\ 6.5}\pm5.1$	[1] AAIJ	19H	LHCB	$pp \rightarrow D^\pm X$
$1306\ \ \pm20$	[2] ANISOVICH	03	RVUE	

[1] From the $D^\pm \rightarrow K^\pm K^+ K^-$ Dalitz plot fit with the Triple-M amplitude in the multi-meson model of AOUDE 18. NODE=M147M5;LINKAGE=A

[2] K-matrix pole from combined analysis of $\pi^- p \rightarrow \pi^0\pi^0 n$, $\pi^- p \rightarrow K\overline{K}n$, $\pi^+\pi^- \rightarrow \pi^+\pi^-$, $\overline{p}p \rightarrow \pi^0\pi^0\pi^0$, $\pi^0\eta\eta$, $\pi^0\pi^0\eta$, $\pi^+\pi^-\pi^0$, $K^+K^-\pi^0$, $K^0_S K^0_S\pi^0$, $K^+K^0_S\pi^-$ at rest, $\overline{p}n \rightarrow \pi^-\pi^-\pi^+$, $K^0_S K^-\pi^0$, $K^0_S K^0_S\pi^-$ at rest. NODE=M147M;LINKAGE=KM

$f_0(1370)$ BREIT-WIGNER WIDTH

NODE=M147210

VALUE (MeV)	DOCUMENT ID
200 to 500 OUR ESTIMATE	

NODE=M147W
→ UNCHECKED ←

$\pi\pi$ MODE

NODE=M147W1
NODE=M147W1

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$300\pm\ 80$		[1] AUBERT	09L	BABR	$B^\pm \rightarrow \pi^\pm\pi^\pm\pi^\mp$
$90^{+\ \ 2}_{-\ \ 1}{}^{+\ 50}_{-\ 22}$		[2] UEHARA	08A	BELL	10.6 $e^+e^- \rightarrow e^+e^-\pi^0\pi^0$
$298\pm\ 21$	2.6k	BONVICINI	07	CLEO	$D^+ \rightarrow \pi^-\pi^+\pi^+$
$126\pm\ 25$	4286	[3] GARMASH	06	BELL	$B^+ \rightarrow K^+\pi^+\pi^-$
$265\pm\ 40$		ABLIKIM	05	BES2	$J/\psi \rightarrow \phi\pi^+\pi^-$
$350\pm100^{+105}_{-\ 60}$		ABLIKIM	05Q	BES2	$\psi(2S) \rightarrow \gamma\pi^+\pi^-K^+K^-$
$173\pm\ 32\pm\ \ 6$	848	AITALA	01A	E791	$D^+_s \rightarrow \pi^-\pi^+\pi^+$
$222\pm\ 20$		BARBERIS	99B	OMEG	450 $pp \rightarrow p_s p_f \pi^+\pi^-$
$255\pm\ 60$		BELLAZZINI	99	GAM4	450 $pp \rightarrow pp\pi^0\pi^0$
$190\pm\ 50$		ALDE	98	GAM4	100 $\pi^- p \rightarrow \pi^0\pi^0 n$
$323\pm\ 13$		BERTIN	98	OBLX	0.05–0.405 $\overline{n}p \rightarrow \pi^+\pi^+\pi^-$
350		[4,5] TORNQVIST	95	RVUE	$\pi\pi \rightarrow \pi\pi$, $K\overline{K}$, $K\pi$, $\eta\pi$
$195\pm\ 33$		ARMSTRONG	91	OMEG	300 $pp \rightarrow pp\pi\pi$, $ppK\overline{K}$
$285\pm\ 60$		BREAKSTONE	90	SFM	62 $pp \rightarrow pp\pi^+\pi^-$
$460\pm\ 50$		AKESSON	86	SPEC	63 $pp \rightarrow pp\pi^+\pi^-$
~ 400		[6] FROGGATT	77	RVUE	$\pi^+\pi^-$ channel

[1] The systematic errors are not reported. NODE=M147W1;LINKAGE=NS

[2] Breit-Wigner width. May also be the $f_0(1500)$. NODE=M147W1;LINKAGE=UE

[3] Also observed by GARMASH 07 in $B^0 \rightarrow K^0_S\pi^+\pi^-$ decays. Supersedes GARMASH 05. NODE=M147W1;LINKAGE=GR

[4] Uses data from BEIER 72B, OCHS 73, HYAMS 73, GRAYER 74, ROSSELET 77, CASON 83, ASTON 88, and ARMSTRONG 91B. Coupled channel analysis with flavor symmetry and all light two-pseudoscalars systems. NODE=M147W1;LINKAGE=BB

[5] Also observed by ASNER 00 in $\tau^- \rightarrow \pi^-\pi^0\pi^0\nu_\tau$ decays NODE=M147W1;LINKAGE=FF

[6] Width defined as distance between 45 and 135° phase shift. NODE=M147W1;LINKAGE=E

$K\overline{K}$ MODE

NODE=M147W2
NODE=M147W2

VALUE (MeV)	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$324\pm\ 38\pm42$	[1] AAIJ	19H	LHCB	$pp \rightarrow D^\pm X$
$121\pm\ 15$	VLADIMIRSK...	06	SPEC	40 $\pi^- p \rightarrow K^0_S K^0_S n$
$55\pm\ 26$	TIKHOMIROV	03	SPEC	40.0 π^- C $\rightarrow K^0_S K^0_S K^0_L$ X
$250\pm\ 80$	BOLONKIN	88	SPEC	40 $\pi^- p \rightarrow K^0_S K^0_S n$
$118^{+138}_{-\ 16}$	ETKIN	82B	MPS	23 $\pi^- p \rightarrow n2K^0_S$
$160\pm\ 30$	WICKLUND	80	SPEC	6 $\pi N \rightarrow K^+K^-N$
~ 150	POLYCHRO...	79	STRC	7 $\pi^- p \rightarrow n2K^0_S$

OCCUR=3

[1] From the $D^\pm \rightarrow K^\pm K^+ K^-$ Dalitz plot fit with the isobar model A. NODE=M147W2;LINKAGE=C

4π MODE $2(\pi\pi)_S+\rho\rho$

NODE=M147W3
NODE=M147W3

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
275±55		ABELE	01	CBAR	0.0 $\overline{p}d \to \pi^- 4\pi^0 p$
375±61		AMSLER	94	CBAR	0.0 $\overline{p}p \to \pi^+\pi^- 3\pi^0$
398±26		ADAMO	93	OBLX	$\overline{n}p \to 3\pi^+ 2\pi^-$
310±50		GASPERO	93	DBC	0.0 $\overline{p}n \to 2\pi^+ 3\pi^-$
~ 90	5751	[1] BETTINI	66	DBC	0.0 $\overline{p}n \to 2\pi^+ 3\pi^-$

[1] $\rho\rho$ dominant.

NODE=M147W3;LINKAGE=BE

$\eta\eta$ MODE

NODE=M147W4
NODE=M147W4

VALUE (MeV)	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$484^{+246}_{-170}{}^{+246}_{-263}$	[1] UEHARA	10A	BELL	10.6 $e^+e^- \to e^+e^-\eta\eta$
250	AMSLER	92	CBAR	0.0 $\overline{p}p \to \pi^0\eta\eta$
320± 40	ALDE	86D	GAM4	100 $\pi^- p \to n2\eta$

[1] Breit-Wigner width. May also be the $f_0(1500)$.

NODE=M147W4;LINKAGE=UE

COUPLED CHANNEL MODE

NODE=M147W5
NODE=M147W5

VALUE (MeV)	DOCUMENT ID		TECN
• • • We do not use the following data for averages, fits, limits, etc. • • •			
147^{+30}_{-50}	[1] ANISOVICH	03	RVUE

[1] K-matrix pole from combined analysis of $\pi^- p \to \pi^0\pi^0 n$, $\pi^- p \to K\overline{K}n$, $\pi^+\pi^- \to \pi^+\pi^-$, $\overline{p}p \to \pi^0\pi^0\pi^0$, $\pi^0\eta\eta$, $\pi^0\pi^0\eta$, $\pi^+\pi^-\pi^0$, $K^+K^-\pi^0$, $K^0_S K^0_S \pi^0$, $K^+ K^0_S \pi^-$ at rest, $\overline{p}n \to \pi^-\pi^-\pi^+$, $K^0_S K^-\pi^0$, $K^0_S K^0_S \pi^-$ at rest.

NODE=M147W;LINKAGE=KM

$f_0(1370)$ DECAY MODES

NODE=M147215;NODE=M147

	Mode	Fraction (Γ_i/Γ)	
Γ_1	$\pi\pi$	seen	DESIG=1;OUR EST;→ UNCHECKED ←
Γ_2	4π	seen	DESIG=10;OUR EST;→ UNCHECKED ←
Γ_3	$4\pi^0$	seen	DESIG=4;OUR EST;→ UNCHECKED ←
Γ_4	$2\pi^+2\pi^-$	seen	DESIG=5;OUR EST;→ UNCHECKED ←
Γ_5	$\pi^+\pi^-2\pi^0$	seen	DESIG=6;OUR EST;→ UNCHECKED ←
Γ_6	$\rho\rho$	seen	DESIG=14;OUR EST;→ UNCHECKED ←
Γ_7	$2(\pi\pi)_{S\text{-wave}}$	seen	DESIG=15;OUR EST;→ UNCHECKED ←
Γ_8	$\pi(1300)\pi$	seen	DESIG=16;OUR EVAL;→ UNCHECKED ←
Γ_9	$a_1(1260)\pi$	seen	DESIG=17;OUR EVAL;→ UNCHECKED ←
Γ_{10}	$\eta\eta$	seen	DESIG=2;OUR EST;→ UNCHECKED ←
Γ_{11}	$K\overline{K}$	seen	DESIG=11;OUR EST;→ UNCHECKED ←
Γ_{12}	$K\overline{K}n\pi$	not seen	DESIG=18;OUR EVAL;→ UNCHECKED ←
Γ_{13}	6π	not seen	DESIG=19;OUR EVAL;→ UNCHECKED ←
Γ_{14}	$\omega\omega$	not seen	DESIG=20;OUR EVAL;→ UNCHECKED ←
Γ_{15}	$\gamma\gamma$	seen	DESIG=12;OUR EST;→ UNCHECKED ←
Γ_{16}	e^+e^-	not seen	DESIG=13;OUR EST;→ UNCHECKED ←

$f_0(1370)$ PARTIAL WIDTHS

NODE=M147217

$\Gamma(\gamma\gamma)$ Γ_{15}

NODE=M147W11

See $\gamma\gamma$ widths under $f_0(500)$ and MORGAN 90.

NODE=M147W11
NODE=M147W11

$\Gamma(e^+e^-)$ Γ_{16}

NODE=M147W12
NODE=M147W12

VALUE (eV)	CL%	DOCUMENT ID		TECN	COMMENT
<20	90	VOROBYEV	88	ND	$e^+e^- \to \pi^0\pi^0$

$f_0(1370)$ $\Gamma(i)\Gamma(\gamma\gamma)/\Gamma(\text{total})$

NODE=M147225

$\Gamma(\eta\eta) \times \Gamma(\gamma\gamma)/\Gamma_{total}$ — $\Gamma_{10}\Gamma_{15}/\Gamma$

NODE=M147G01
NODE=M147G01

VALUE (eV)	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •			
$121^{+133}_{-53}{}^{+169}_{-106}$	[1] UEHARA 10A	BELL	$10.6\ e^+e^- \to e^+e^-\eta\eta$

[1] Including interference with the $f'_2(1525)$ (parameters fixed to the values from the 2008 edition of this review, PDG 08) and $f_2(1270)$. May also be the $f_0(1500)$.

NODE=M147G01;LINKAGE=UE

$f_0(1370)$ BRANCHING RATIOS

NODE=M147220

$\Gamma(\pi\pi)/\Gamma_{total}$ — Γ_1/Γ

NODE=M147R3
NODE=M147R3

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
<0.10	95	OCHS 13	RVUE	
0.26±0.09		BUGG 96	RVUE	
<0.15		[1] AMSLER 94	CBAR	$\overline{p}p \to \pi^+\pi^-3\pi^0$
<0.06		GASPERO 93	DBC	$0.0\ \overline{p}n \to$ hadrons

[1] Using AMSLER 95B ($3\pi^0$).

NODE=M147R3;LINKAGE=B

$\Gamma(4\pi)/\Gamma_{total}$ — $\Gamma_2/\Gamma = (\Gamma_3+\Gamma_4+\Gamma_5)/\Gamma$

NODE=M147R4
NODE=M147R4

VALUE	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •			
>0.72	GASPERO 93	DBC	$0.0\ \overline{p}n \to$ hadrons

$\Gamma(4\pi^0)/\Gamma(4\pi)$ — Γ_3/Γ_2

NODE=M147R12
NODE=M147R12

VALUE	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •			
seen	ABELE 96	CBAR	$0.0\ \overline{p}p \to 5\pi^0$
0.068±0.005	[1] GASPERO 93	DBC	$0.0\ \overline{p}n \to$ hadrons

[1] Model-dependent evaluation.

NODE=M147R12;LINKAGE=GA

$\Gamma(2\pi^+2\pi^-)/\Gamma(4\pi)$ — $\Gamma_4/\Gamma_2 = \Gamma_4/(\Gamma_3+\Gamma_4+\Gamma_5)$

NODE=M147R5
NODE=M147R5

VALUE	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •			
0.420±0.014	[1] GASPERO 93	DBC	$0.0\ \overline{p}n \to 2\pi^+3\pi^-$

[1] Model-dependent evaluation.

NODE=M147R5;LINKAGE=A

$\Gamma(\pi^+\pi^-2\pi^0)/\Gamma(4\pi)$ — $\Gamma_5/\Gamma_2 = \Gamma_5/(\Gamma_3+\Gamma_4+\Gamma_5)$

NODE=M147R6
NODE=M147R6

VALUE	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •			
0.512±0.019	[1] GASPERO 93	DBC	$0.0\ \overline{p}n \to$ hadrons

[1] Model-dependent evaluation.

NODE=M147R6;LINKAGE=A

$\Gamma(\rho\rho)/\Gamma(4\pi)$ — Γ_6/Γ_2

NODE=M147R17
NODE=M147R17

VALUE	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •			
0.26±0.07	ABELE 01B	CBAR	$0.0\ \overline{p}d \to 5\pi p$

$\Gamma(2(\pi\pi)_{S\text{-wave}})/\Gamma(\pi\pi)$ — Γ_7/Γ_1

NODE=M147R15
NODE=M147R15

VALUE	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •			
5.6±2.6	[1] ABELE 01	CBAR	$0.0\ \overline{p}d \to \pi^-4\pi^0 p$

[1] From the combined data of ABELE 96 and ABELE 96C.

NODE=M147R;LINKAGE=KZ

$\Gamma(2(\pi\pi)_{S\text{-wave}})/\Gamma(4\pi)$ — Γ_7/Γ_2

NODE=M147R16
NODE=M147R16

VALUE	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •			
0.51±0.09	ABELE 01B	CBAR	$0.0\ \overline{p}d \to 5\pi p$

$\Gamma(\rho\rho)/\Gamma(2(\pi\pi)_{S\text{-wave}})$ — Γ_6/Γ_7

NODE=M147R10

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
large	BARBERIS	00C		450 $pp \to p_f 4\pi p_s$
1.6 ±0.2	AMSLER	94	CBAR	$\overline{p}p \to \pi^+\pi^- 3\pi^0$
∼ 0.65	GASPERO	93	DBC	0.0 $\overline{p}n \to$ hadrons

OCCUR=2

$\Gamma(\pi(1300)\pi)/\Gamma(4\pi)$ — Γ_8/Γ_2

NODE=M147R18

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.17±0.06	ABELE	01B	CBAR	0.0 $\overline{p}d \to 5\pi p$

$\Gamma(a_1(1260)\pi)/\Gamma(4\pi)$ — Γ_9/Γ_2

NODE=M147R19

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.06±0.02	ABELE	01B	CBAR	0.0 $\overline{p}d \to 5\pi p$

$\Gamma(\eta\eta)/\Gamma(4\pi)$ — $\Gamma_{10}/\Gamma_2 = \Gamma_{10}/(\Gamma_3+\Gamma_4+\Gamma_5)$

NODE=M147R14

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$(28 \pm 11) \times 10^{-3}$	[1] ANISOVICH	02D	SPEC	Combined fit
$(4.7 \pm 2.0) \times 10^{-3}$	BARBERIS	00E		450 $pp \to p_f \eta\eta p_s$

[1] From a combined K-matrix analysis of Crystal Barrel (0. $p\overline{p} \to \pi^0\pi^0\pi^0$, $\pi^0\eta\eta$, $\pi^0\pi^0\eta$), GAMS ($\pi p \to \pi^0\pi^0 n$, $\eta\eta n$, $\eta\eta' n$), and BNL ($\pi p \to K\overline{K} n$) data.

NODE=M147R14;LINKAGE=CH

$\Gamma(K\overline{K})/\Gamma_{total}$ — Γ_{11}/Γ

NODE=M147R11

VALUE	DOCUMENT ID		TECN
• • • We do not use the following data for averages, fits, limits, etc. • • •			
0.35±0.13	BUGG	96	RVUE

$\Gamma(K\overline{K})/\Gamma(\pi\pi)$ — Γ_{11}/Γ_1

NODE=M147R13

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.08±0.08	ABLIKIM	05	BES2	$J/\psi \to \phi\pi^+\pi^-$, ϕK^+K^-
0.91±0.20	[1] BARGIOTTI	03	OBLX	$\overline{p}p$
0.12±0.06	[2] ANISOVICH	02D	SPEC	Combined fit
0.46±0.15±0.11	BARBERIS	99D	OMEG	450 $pp \to K^+K^-$, $\pi^+\pi^-$

[1] Coupled channel analysis of $\pi^+\pi^-\pi^0$, $K^+K^-\pi^0$, and $K^\pm K^0_S\pi^\mp$.

NODE=M147R;LINKAGE=BG

[2] From a combined K-matrix analysis of Crystal Barrel (0. $p\overline{p} \to \pi^0\pi^0\pi^0$, $\pi^0\eta\eta$, $\pi^0\pi^0\eta$), GAMS ($\pi p \to \pi^0\pi^0 n$, $\eta\eta n$, $\eta\eta' n$), and BNL ($\pi p \to K\overline{K} n$) data.

NODE=M147R;LINKAGE=CH

$\Gamma(K\overline{K}n\pi)/\Gamma_{total}$ — Γ_{12}/Γ

NODE=M147R20

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
<0.03	GASPERO	93	DBC	0.0 $\overline{p}n \to$ hadrons

$\Gamma(6\pi)/\Gamma_{total}$ — Γ_{13}/Γ

NODE=M147R21

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
<0.22	GASPERO	93	DBC	0.0 $\overline{p}n \to$ hadrons

$\Gamma(\omega\omega)/\Gamma_{total}$ — Γ_{14}/Γ

NODE=M147R22

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
<0.13	GASPERO	93	DBC	0.0 $\overline{p}n \to$ hadrons

f_0(1370) REFERENCES

NODE=M147

PELAEZ	23	PRL 130 051902	J.R. Pelaez, A. Rodas, J. Ruiz de Elvira	(MADU+)	REFID=62199
SARANTSEV	21	PL B816 136227	A.V. Sarantsev *et al.*	(BONN, PNPI)	REFID=61091
ALBRECHT	20	EPJ C80 453	M. Albrecht *et al.*	(Crystal Barrel Collab.)	REFID=60439
AAIJ	19H	JHEP 1904 063	R. Aaij *et al.*	(LHCb Collab.)	REFID=59670
AOUDE	18	PR D98 056021	R.T. Aoude *et al.*		REFID=59987
DOBBS	15	PR D91 052006	S. Dobbs *et al.*	(NWES)	REFID=56805
OCHS	13	JP G40 043001	W. Ochs		REFID=55367
UEHARA	10A	PR D82 114031	S. Uehara *et al.*	(BELLE Collab.)	REFID=53641
ANISOVICH	09	IJMP A24 2481	V.V. Anisovich, A.V. Sarantsev	(PNPI)	REFID=52719
AUBERT	09L	PR D79 072006	B. Aubert *et al.*	(BABAR Collab.)	REFID=52723
PDG	08	PL B667 1	C. Amsler *et al.*	(PDG Collab.)	REFID=52166
UEHARA	08A	PR D78 052004	S. Uehara *et al.*	(BELLE Collab.)	REFID=52309
BONVICINI	07	PR D76 012001	G. Bonvicini *et al.*	(CLEO Collab.)	REFID=51721
BUGG	07A	JP G34 151	D.V. Bugg *et al.*		REFID=53252
GARMASH	07	PR D75 012006	A. Garmash *et al.*	(BELLE Collab.)	REFID=51594
GARMASH	06	PRL 96 251803	A. Garmash *et al.*	(BELLE Collab.)	REFID=51162
PDG	06	JP G33 1	W.-M. Yao *et al.*	(PDG Collab.)	REFID=51004
VLADIMIRSK...	06	PAN 69 493	V.V. Vladimirsky *et al.*	(ITEP, Moscow)	REFID=51191
		Translated from YAF 69 515.			
ABLIKIM	05	PL B607 243	M. Ablikim *et al.*	(BES Collab.)	REFID=50450
ABLIKIM	05Q	PR D72 092002	M. Ablikim *et al.*	(BES Collab.)	REFID=50958
GARMASH	05	PR D71 092003	A. Garmash *et al.*	(BELLE Collab.)	REFID=50641
ANISOVICH	03	EPJ A16 229	V.V. Anisovich *et al.*		REFID=49401
BARGIOTTI	03	EPJ C26 371	M. Bargiotti *et al.*	(OBELIX Collab.)	REFID=49217
TIKHOMIROV	03	PAN 66 828	G.D. Tikhomirov *et al.*		REFID=49423
		Translated from YAF 66 860.			
ANISOVICH	02D	PAN 65 1545	V.V. Anisovich *et al.*		REFID=48831
		Translated from YAF 65 1583.			
ABELE	01	EPJ C19 667	A. Abele *et al.*	(Crystal Barrel Collab.)	REFID=48334
ABELE	01B	EPJ C21 261	A. Abele *et al.*	(Crystal Barrel Collab.)	REFID=48356
AITALA	01A	PRL 86 765	E.M. Aitala *et al.*	(FNAL E791 Collab.)	REFID=48004
ASNER	00	PR D61 012002	D.M. Asner *et al.*	(CLEO Collab.)	REFID=47339
BARBERIS	00C	PL B471 440	D. Barberis *et al.*	(WA 102 Collab.)	REFID=47959
BARBERIS	00E	PL B479 59	D. Barberis *et al.*	(WA 102 Collab.)	REFID=47961
BARBERIS	99B	PL B453 316	D. Barberis *et al.*	(Omega Expt.)	REFID=46922
BARBERIS	99D	PL B462 462	D. Barberis *et al.*	(Omega Expt.)	REFID=47395
BELLAZZINI	99	PL B467 296	R. Bellazzini *et al.*		REFID=47400
KAMINSKI	99	EPJ C9 141	R. Kaminski, L. Lesniak, B. Loiseau	(CRAC, PARIN)	REFID=46927
ALDE	98	EPJ A3 361	D. Alde *et al.*	(GAM4 Collab.)	REFID=46605
Also		PAN 62 405	D. Alde *et al.*	(GAMS Collab.)	REFID=46914
		Translated from YAF 62 446.			
ANISOVICH	98B	SPU 41 419	V.V. Anisovich *et al.*		REFID=46331
		Translated from UFN 168 481.			
BERTIN	98	PR D57 55	A. Bertin *et al.*	(OBELIX Collab.)	REFID=45782
BARBERIS	97B	PL B413 217	D. Barberis *et al.*	(WA 102 Collab.)	REFID=45758
BERTIN	97C	PL B408 476	A. Bertin *et al.*	(OBELIX Collab.)	REFID=45701
ABELE	96	PL B380 453	A. Abele *et al.*	(Crystal Barrel Collab.)	REFID=45011
ABELE	96B	PL B385 425	A. Abele *et al.*	(Crystal Barrel Collab.)	REFID=45038
ABELE	96C	NP A609 562	A. Abele *et al.*	(Crystal Barrel Collab.)	REFID=45076
BUGG	96	NP B471 59	D.V. Bugg, A.V. Sarantsev, B.S. Zou	(LOQM, PNPI)	REFID=45094
AMSLER	95B	PL B342 433	C. Amsler *et al.*	(Crystal Barrel Collab.)	REFID=44377
AMSLER	95C	PL B353 571	C. Amsler *et al.*	(Crystal Barrel Collab.)	REFID=44440
AMSLER	95D	PL B355 425	C. Amsler *et al.*	(Crystal Barrel Collab.)	REFID=44441
JANSSEN	95	PR D52 2690	G. Janssen *et al.*	(STON, ADLD, JULI)	REFID=44508
TORNQVIST	95	ZPHY C68 647	N.A. Tornqvist	(HELS)	REFID=44529
AMSLER	94	PL B322 431	C. Amsler *et al.*	(Crystal Barrel Collab.) JPC	REFID=43660
AMSLER	94D	PL B333 277	C. Amsler *et al.*	(Crystal Barrel Collab.)	REFID=44093
ANISOVICH	94	PL B323 233	V.V. Anisovich *et al.*	(Crystal Barrel Collab.) JPC	REFID=43659
BUGG	94	PR D50 4412	D.V. Bugg *et al.*	(LOQM)	REFID=44078
KAMINSKI	94	PR D50 3145	R. Kaminski, L. Lesniak, J.P. Maillet	(CRAC+)	REFID=45771
ADAMO	93	NP A558 13C	A. Adamo *et al.*	(OBELIX Collab.) JPC	REFID=43657
GASPERO	93	NP A562 407	M. Gaspero	(ROMAI) JPC	REFID=43658
AMSLER	92	PL B291 347	C. Amsler *et al.*	(Crystal Barrel Collab.)	REFID=43169
ARMSTRONG	91	ZPHY C51 351	T.A. Armstrong *et al.*	(ATHU, BARI, BIRM+)	REFID=41744
ARMSTRONG	91B	ZPHY C52 389	T.A. Armstrong *et al.*	(ATHU, BARI, BIRM+)	REFID=41862
BREAKSTONE	90	ZPHY C48 569	A.M. Breakstone *et al.*	(ISU, BGNA, CERN+)	REFID=41376
MORGAN	90	ZPHY C48 623	D. Morgan, M.R. Pennington	(RAL, DURH)	REFID=41583
ASTON	88	NP B296 493	D. Aston *et al.*	(SLAC, NAGO, CINC, INUS)	REFID=40262
BOLONKIN	88	NP B309 426	B.V. Bolonkin *et al.*	(ITEP, SERP)	REFID=40580
FALVARD	88	PR D38 2706	A. Falvard *et al.*	(CLER, FRAS, LALO+)	REFID=40576
VOROBYEV	88	SJNP 48 273	P.V. Vorobiev *et al.*	(NOVO)	REFID=41023
		Translated from YAF 48 436.			
AU	87	PR D35 1633	K.L. Au, D. Morgan, M.R. Pennington	(DURH, RAL)	REFID=40064
AKESSON	86	NP B264 154	T. Akesson *et al.*	(Axial Field Spec. Collab.)	REFID=21123
ALDE	86D	NP B269 485	D.M. Alde *et al.*	(BELG, LAPP, SERP, CERN+)	REFID=20765
LONGACRE	86	PL B177 223	R.S. Longacre *et al.*	(BNL, BRAN, CUNY+)	REFID=20768
BINON	84C	NC 80A 363	F.G. Binon *et al.*	(BELG, LAPP, SERP+)	REFID=21418
BINON	83	NC 78A 313	F.G. Binon *et al.*	(BELG, LAPP, SERP+)	REFID=20750
CASON	83	PR D28 1586	N.M. Cason *et al.*	(NDAM, ANL)	REFID=20752
ETKIN	82B	PR D25 1786	A. Etkin *et al.*	(BNL, CUNY, TUFTS, VAND)	REFID=20390
WICKLUND	80	PRL 45 1469	A.B. Wicklund *et al.*	(ANL)	REFID=20383
BECKER	79	NP B151 46	H. Becker *et al.*	(MPIM, CERN, ZEEM, CRAC)	REFID=21084
POLYCHRO...	79	PR D19 1317	V.A. Polychronakos *et al.*	(NDAM, ANL)	REFID=20378
FROGGATT	77	NP B129 89	C.D. Froggatt, J.L. Petersen	(GLAS, NORD)	REFID=21072
ROSSELET	77	PR D15 574	L. Rosselet *et al.*	(GEVA, SACL)	REFID=11004
HYAMS	75	NP B100 205	B.D. Hyams *et al.*	(CERN, MPIM)	REFID=20355
GRAYER	74	NP B75 189	G. Grayer *et al.*	(CERN, MPIM)	REFID=20113
HYAMS	73	NP B64 134	B.D. Hyams *et al.*	(CERN, MPIM)	REFID=20107
OCHS	73	Thesis	W. Ochs	(MPIM, MUNI)	REFID=20349
BEIER	72B	PRL 29 511	E.W. Beier *et al.*	(PENN)	REFID=44530
BETTINI	66	NC 42A 695	A. Bettini *et al.*	(PADO, PISA)	REFID=21361