

$f_1(1285)$

$$I^G(J^{PC}) = 0^+(1^{++})$$

 $f_1(1285)$ MASS

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
1281.9 ± 0.5	OUR AVERAGE	Error includes scale factor of 1.8. See the ideogram below.		
1281.0 ± 0.8		DICKSON	16 CLAS	2.55 $\gamma p \rightarrow \eta \pi^+ \pi^- p$
1287.4 ± 3.0	87	ABLIKIM	15P BES3	$J/\psi \rightarrow K^+ K^- 3\pi$
1281.16 ± 0.39 ± 0.45		¹ LEES	12X BABR	$\tau^- \rightarrow \pi^- f_1(1285) \nu_\tau$
1285.1 ± 1.0 $\begin{smallmatrix} + \\ - \end{smallmatrix} \begin{smallmatrix} 1.6 \\ 0.3 \end{smallmatrix}$		² ABLIKIM	11J BES3	$J/\psi \rightarrow \omega(\eta \pi^+ \pi^-)$
1281 ± 2 ± 1		AUBERT	07AU BABR	10.6 $e^+ e^- \rightarrow f_1(1285) \pi^+ \pi^- \gamma$
1276.1 ± 8.1 ± 8.0	203	BAI	04J BES2	$J/\psi \rightarrow \gamma \gamma \pi^+ \pi^-$
1274 ± 6	237	ABDALLAH	03H DLPH	91.2 $e^+ e^- \rightarrow K_S^0 K^\pm \pi^\mp + X$
1280 ± 4		ACCIARRI	01G L3	
1288 ± 4 ± 5	20k	ADAMS	01B B852	18 GeV $\pi^- p \rightarrow K^+ K^- \pi^0 n$
1284 ± 6	1400	ALDE	97B GAM4	100 $\pi^- p \rightarrow \eta \pi^0 \pi^0 n$
1281 ± 1		BARBERIS	97B OMEG	450 $pp \rightarrow pp 2(\pi^+ \pi^-)$
1281 ± 1		BARBERIS	97C OMEG	450 $pp \rightarrow pp K_S^0 K^\pm \pi^\mp$
1280 ± 2		³ ANTINORI	95 OMEG	300,450 $pp \rightarrow pp 2(\pi^+ \pi^-)$
1282.2 ± 1.5		LEE	94 MPS2	18 $\pi^- p \rightarrow K^+ \bar{K}^0 2\pi^- p$
1279 ± 5		FUKUI	91C SPEC	8.95 $\pi^- p \rightarrow \eta \pi^+ \pi^- n$
1278 ± 2	140	ARMSTRONG	89 OMEG	300 $pp \rightarrow K \bar{K} \pi pp$
1278 ± 2		ARMSTRONG	89G OMEG	85 $\pi^+ p \rightarrow 4\pi \pi p, pp \rightarrow 4\pi pp$
1280.1 ± 2.1	60	RATH	89 MPS	21.4 $\pi^- p \rightarrow K_S^0 K_S^0 \pi^0 n$
1285 ± 1	4750	⁴ BIRMAN	88 MPS	8 $\pi^- p \rightarrow K^+ \bar{K}^0 \pi^- n$
1280 ± 1	504	BITYUKOV	88 SPEC	32.5 $\pi^- p \rightarrow K^+ K^- \pi^0 n$
1280 ± 4		ANDO	86 SPEC	8 $\pi^- p \rightarrow \eta \pi^+ \pi^- n$
1277 ± 2	420	REEVES	86 SPEC	6.6 $p\bar{p} \rightarrow K K \pi X$
1285 ± 2		CHUNG	85 SPEC	8 $\pi^- p \rightarrow N K \bar{K} \pi$
1279 ± 2	604	ARMSTRONG	84 OMEG	85 $\pi^+ p \rightarrow K \bar{K} \pi \pi p, pp \rightarrow K \bar{K} \pi pp$
1286 ± 1		CHAUVAT	84 SPEC	ISR 31.5 pp
1278 ± 4		EVANGELIS...	81 OMEG	12 $\pi^- p \rightarrow \eta \pi^+ \pi^- \pi^- p$
1283 ± 3	103	DIONISI	80 HBC	4 $\pi^- p \rightarrow K \bar{K} \pi n$
1282 ± 2	320	NACASCH	78 HBC	0.7,0.76 $p\bar{p} \rightarrow K \bar{K} 3\pi$
1279 ± 5	210	GRASSLER	77 HBC	16 $\pi^\mp p$
1286 ± 3	180	DUBOC	72 HBC	1.2 $p\bar{p} \rightarrow 2K 4\pi$
1283 ± 5		DAHL	67 HBC	1.6–4.2 $\pi^- p$

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

1284.2 ± 2.2		⁵ AAIJ	14Y	LHCB	$\overline{B}_{(s)}^0 \rightarrow J/\psi 2(\pi^+ \pi^-)$
1281.9 ± 0.5		⁵ SOSA	99	SPEC	$p p \rightarrow p_{\text{slow}} (K_S^0 K^+ \pi^-) p_{\text{fast}}$
1282.8 ± 0.6		⁵ SOSA	99	SPEC	$p p \rightarrow p_{\text{slow}} (K_S^0 K^- \pi^+) p_{\text{fast}}$
1270 ± 10		AMELIN	95	VES	$37 \pi^- N \rightarrow \pi^- \pi^+ \pi^- \gamma N$
1280 ± 2		ABATZIS	94	OMEG	$450 p p \rightarrow p p 2(\pi^+ \pi^-)$
1282 ± 4		ARMSTRONG	93C	E760	$\overline{p} p \rightarrow \pi^0 \eta \eta \rightarrow 6\gamma$
1270 ± 6 ± 10		ARMSTRONG	92C	OMEG	$300 p p \rightarrow p p \pi^+ \pi^- \gamma$
1281 ± 1		ARMSTRONG	89E	OMEG	$300 p p \rightarrow p p 2(\pi^+ \pi^-)$
1279 ± 6 ± 10	16	BECKER	87	MRK3	$e^+ e^- \rightarrow \phi K \overline{K} \pi$
1286 ± 9		GIDAL	87	MRK2	$e^+ e^- \rightarrow e^+ e^- \eta \pi^+ \pi^-$
1287 ± 5	353	BITYUKOV	84B	SPEC	$32 \pi^- p \rightarrow K^+ K^- \pi^0 n$
~ 1279		⁶ TORNQVIST	82B	RVUE	
1275 ± 6	31	BROMBERG	80	SPEC	$100 \pi^- p \rightarrow K \overline{K} \pi X$
1288 ± 9	200	GURTU	79	HBC	$4.2 K^- p \rightarrow n \eta 2\pi$
~ 1275.0	46	⁷ STANTON	79	CNTR	$8.5 \pi^- p \rightarrow n 2\gamma 2\pi$
1271 ± 10	34	CORDEN	78	OMEG	$12-15 \pi^- p \rightarrow K^+ K^- \pi n$
1295 ± 12	85	CORDEN	78	OMEG	$12-15 \pi^- p \rightarrow n 5\pi$
1292 ± 10	150	DEFOIX	72	HBC	$0.7 \overline{p} p \rightarrow 7\pi$
1280 ± 3	500	⁸ THUN	72	MMS	$13.4 \pi^- p$
1303 ± 8		BARDADIN-...	71	HBC	$8 \pi^+ p \rightarrow p 6\pi$
1283 ± 6		BOESEBECK	71	HBC	$16.0 \pi p \rightarrow p 5\pi$
1270 ± 10		CAMPBELL	69	DBC	$2.7 \pi^+ d$
1285 ± 7		LORSTAD	69	HBC	$0.7 \overline{p} p, 4,5\text{-body}$
1290 ± 7		D'ANDLAU	68	HBC	$1.2 \overline{p} p, 5-6\text{ body}$

¹ Using the $2\pi^+ 2\pi^-$ and $\pi^+ \pi^- \eta$ modes of $f_1(1285)$ decay.

² The selected process is $J/\psi \rightarrow \omega a_0(980)\pi$.

³ Supersedes ABATZIS 94, ARMSTRONG 89E.

⁴ From partial wave analysis of $K^+ \overline{K}^0 \pi^-$ system.

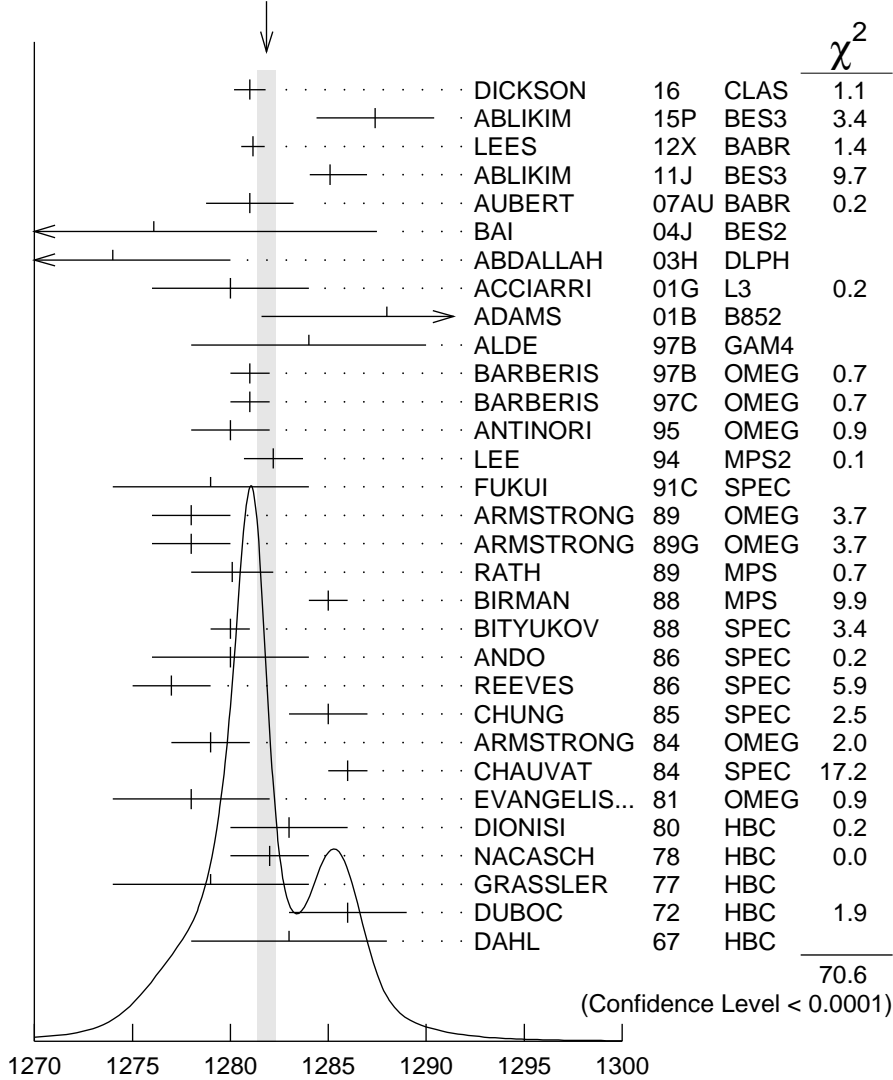
⁵ No systematic error given.

⁶ From a unitarized quark-model calculation.

⁷ From phase shift analysis of $\eta \pi^+ \pi^-$ system.

⁸ Seen in the missing mass spectrum.

WEIGHTED AVERAGE
 1281.9 ± 0.5 (Error scaled by 1.8)



$f_1(1285)$ mass (MeV)

$f_1(1285)$ WIDTH

Only experiments giving width error less than 20 MeV are kept for averaging.

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
22.7 ± 1.1 OUR AVERAGE		Error includes scale factor of 1.5. See the ideogram below.		
18.4 ± 1.4		DICKSON	16 CLAS	$2.55 \gamma p \rightarrow \eta \pi^+ \pi^- p$
18.3 ± 6.3	87	ABLIKIM	15P BES3	$J/\psi \rightarrow K^+ K^- 3\pi$
$22.0 \pm 3.1^{+2.0}_{-1.5}$		¹ ABLIKIM	11J BES3	$J/\psi \rightarrow \omega(\eta \pi^+ \pi^-)$
$35 \pm 6 \pm 4$		AUBERT	07AU BABR	$10.6 e^+ e^- \rightarrow f_1(1285) \pi^+ \pi^- \gamma$
$40.0 \pm 8.6 \pm 9.3$	203	BAI	04J BES2	$J/\psi \rightarrow \gamma \gamma \pi^+ \pi^-$

29 ± 12	237	ABDALLAH	03H	DLPH	91.2	$e^+e^- \rightarrow K_S^0 K^\pm \pi^\mp + X$
45 ± 9 ± 7	20k	ADAMS	01B	B852	18 GeV	$\pi^- p \rightarrow K^+ K^- \pi^0 n$
55 ± 18	1400	ALDE	97B	GAM4	100	$\pi^- p \rightarrow \eta \pi^0 \pi^0 n$
24 ± 3		BARBERIS	97B	OMEG	450	$pp \rightarrow pp2(\pi^+ \pi^-)$
20 ± 2		BARBERIS	97C	OMEG	450	$pp \rightarrow ppK_S^0 K^\pm \pi^\mp$
36 ± 5		² ANTINORI	95	OMEG	300,450	$pp \rightarrow pp2(\pi^+ \pi^-)$
29.0 ± 4.1		LEE	94	MPS2	18	$\pi^- p \rightarrow K^+ \bar{K}^0 2\pi^- p$
25 ± 4	140	ARMSTRONG	89	OMEG	300	$pp \rightarrow K \bar{K} \pi pp$
22 ± 2	4750	³ BIRMAN	88	MPS	8	$\pi^- p \rightarrow K^+ \bar{K}^0 \pi^- n$
25 ± 4	504	BITYUKOV	88	SPEC	32.5	$\pi^- p \rightarrow K^+ K^- \pi^0 n$
19 ± 5		ANDO	86	SPEC	8	$\pi^- p \rightarrow \eta \pi^+ \pi^- n$
32 ± 8	420	REEVES	86	SPEC	6.6	$p\bar{p} \rightarrow KK\pi X$
22 ± 2		CHUNG	85	SPEC	8	$\pi^- p \rightarrow NK\bar{K}\pi$
32 ± 3	604	ARMSTRONG	84	OMEG	85	$\pi^+ p \rightarrow K\bar{K}\pi\pi p,$ $pp \rightarrow K\bar{K}\pi pp$
24 ± 3		CHAUVAT	84	SPEC	ISR 31.5	pp
29 ± 10	103	DIONISI	80	HBC	4	$\pi^- p \rightarrow K\bar{K}\pi n$
28.3 ± 6.7	320	NACASCH	78	HBC	0.7, 0.76	$\bar{p}p \rightarrow K\bar{K}3\pi$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●						
32.4 ± 5.8		⁴ AAJ	14Y	LHCB		$\bar{B}_{(s)}^0 \rightarrow J/\psi 2(\pi^+ \pi^-)$
18.2 ± 1.2		⁴ SOSA	99	SPEC		$pp \rightarrow p_{\text{slow}} (K_S^0 K^+ \pi^-)$ p_{fast}
19.4 ± 1.5		⁴ SOSA	99	SPEC		$pp \rightarrow p_{\text{slow}} (K_S^0 K^- \pi^+)$ p_{fast}
40 ± 5		ABATZIS	94	OMEG	450	$pp \rightarrow pp2(\pi^+ \pi^-)$
31 ± 5		ARMSTRONG	89E	OMEG	300	$pp \rightarrow pp2(\pi^+ \pi^-)$
41 ± 12		ARMSTRONG	89G	OMEG	85	$\pi^+ p \rightarrow 4\pi\pi p, pp \rightarrow 4\pi pp$
17.9 ± 10.9	60	RATH	89	MPS	21.4	$\pi^- p \rightarrow K_S^0 K_S^0 \pi^0 n$
14 ⁺²⁰ / ₋₁₄ ± 10	16	BECKER	87	MRK3		$e^+e^- \rightarrow \phi K\bar{K}\pi$
26 ± 12		EVANGELIS...	81	OMEG	12	$\pi^- p \rightarrow \eta \pi^+ \pi^- \pi^- p$
25 ± 15	200	GURTU	79	HBC	4.2	$K^- p \rightarrow n\eta 2\pi$
~ 10		⁵ STANTON	79	CNTR	8.5	$\pi^- p \rightarrow n2\gamma 2\pi$
24 ± 18	210	GRASSLER	77	HBC	16	$\pi^\mp p$
28 ± 5	150	⁶ DEFOIX	72	HBC	0.7	$\bar{p}p \rightarrow 7\pi$
46 ± 9	180	⁶ DUBOC	72	HBC	1.2	$\bar{p}p \rightarrow 2K4\pi$
37 ± 5	500	⁷ THUN	72	MMS	13.4	$\pi^- p$
10 ± 10		BOESEBECK	71	HBC	16.0	$\pi p \rightarrow p5\pi$
30 ± 15		CAMPBELL	69	DBC	2.7	$\pi^+ d$
60 ± 15		⁶ LORSTAD	69	HBC	0.7	$\bar{p}p, 4,5\text{-body}$
35 ± 10		⁶ DAHL	67	HBC	1.6-4.2	$\pi^- p$

¹ The selected process is $J/\psi \rightarrow \omega a_0(980)\pi$.

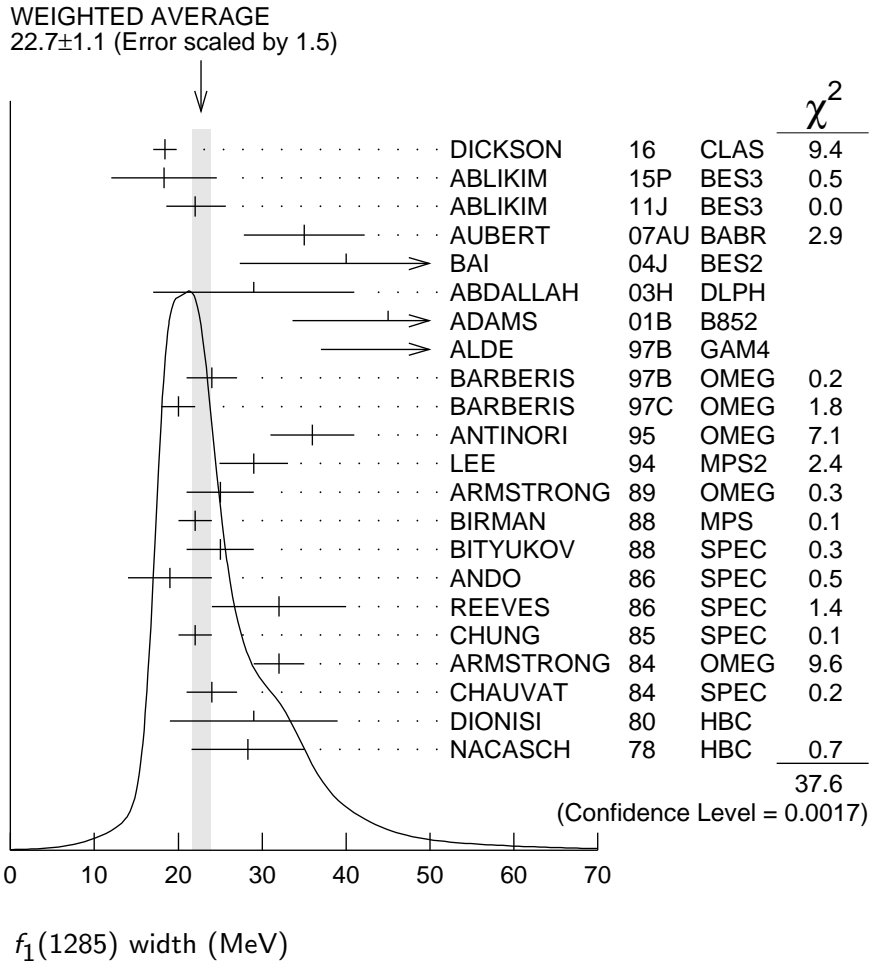
² Supersedes ABATZIS 94, ARMSTRONG 89E.

³ From partial wave analysis of $K^+ \bar{K}^0 \pi^-$ system.

⁴ No systematic error given.

⁵ From phase shift analysis of $\eta \pi^+ \pi^-$ system.

⁶ Resolution is not unfolded.
⁷ Seen in the missing mass spectrum.



$f_1(1285)$ DECAY MODES

Mode	Fraction (Γ_i/Γ)	Scale factor/ Confidence level
Γ_1 4π	$(33.5^{+2.0}_{-1.8})\%$	S=1.3
Γ_2 $\pi^0\pi^0\pi^+\pi^-$	$(22.3^{+1.3}_{-1.2})\%$	S=1.3
Γ_3 $2\pi^+2\pi^-$	$(11.2^{+0.7}_{-0.6})\%$	S=1.3
Γ_4 $\rho^0\pi^+\pi^-$	$(11.2^{+0.7}_{-0.6})\%$	S=1.3
Γ_5 $\rho^0\rho^0$	seen	
Γ_6 $4\pi^0$	$< 7 \times 10^{-4}$	CL=90%
Γ_7 $\eta\pi^+\pi^-$	$(35 \pm 15)\%$	
Γ_8 $\eta\pi\pi$	$(52.0^{+1.8}_{-2.1})\%$	S=1.2

Γ_9	$a_0(980)\pi$ [ignoring $a_0(980) \rightarrow K\bar{K}$]	$(38 \pm 4) \%$	
Γ_{10}	$\eta\pi\pi$ [excluding $a_0(980)\pi$]	$(14 \pm 4) \%$	
Γ_{11}	$K\bar{K}\pi$	$(9.1 \pm 0.4) \%$	S=1.1
Γ_{12}	$K\bar{K}^*(892)$	not seen	
Γ_{13}	$\pi^+\pi^-\pi^0$	$(3.0 \pm 0.9) \times 10^{-3}$	
Γ_{14}	$\rho^\pm\pi^\mp$	$< 3.1 \times 10^{-3}$	CL=95%
Γ_{15}	$\gamma\rho^0$	$(5.3 \pm 1.2) \%$	S=2.9
Γ_{16}	$\phi\gamma$	$(7.5 \pm 2.7) \times 10^{-4}$	
Γ_{17}	$\gamma\gamma^*$		
Γ_{18}	$\gamma\gamma$		

CONSTRAINED FIT INFORMATION

An overall fit to 7 branching ratios uses 19 measurements and one constraint to determine 5 parameters. The overall fit has a $\chi^2 = 33.5$ for 15 degrees of freedom.

The following *off-diagonal* array elements are the correlation coefficients $\langle \delta x_i \delta x_j \rangle / (\delta x_i \delta x_j)$, in percent, from the fit to the branching fractions, $x_i \equiv \Gamma_i / \Gamma_{\text{total}}$. The fit constrains the x_i whose labels appear in this array to sum to one.

x_9	-28			
x_{10}	-11	-88		
x_{11}	34	-11	-5	
x_{15}	-36	-7	-3	-34
	x_1	x_9	x_{10}	x_{11}

$f_1(1285) \Gamma(i)\Gamma(\gamma\gamma)/\Gamma(\text{total})$

$\Gamma(\eta\pi\pi) \times \Gamma(\gamma\gamma)/\Gamma_{\text{total}}$		$\Gamma_8\Gamma_{18}/\Gamma = (\Gamma_9+\Gamma_{10})\Gamma_{18}/\Gamma$		
<u>VALUE (keV)</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<0.62	95	GIDAL	87	MRK2 $e^+e^- \rightarrow e^+e^-\eta\pi^+\pi^-$

$\Gamma(\eta\pi\pi) \times \Gamma(\gamma\gamma^*)/\Gamma_{\text{total}}$		$\Gamma_8\Gamma_{17}/\Gamma = (\Gamma_9+\Gamma_{10})\Gamma_{17}/\Gamma$		
<u>VALUE (keV)</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
1.4 ± 0.4 OUR AVERAGE		Error includes scale factor of 1.4.		
1.18 ± 0.25 ± 0.20	26	1,2 AIHARA	88B	TPC $e^+e^- \rightarrow e^+e^-\eta\pi^+\pi^-$
2.30 ± 0.61 ± 0.42		1,3 GIDAL	87	MRK2 $e^+e^- \rightarrow e^+e^-\eta\pi^+\pi^-$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
1.8 ± 0.3 ± 0.3	420	4 ACHARD	02B	L3 183–209 $e^+e^- \rightarrow e^+e^-\eta\pi^+\pi^-$

¹ Assuming a ρ -pole form factor.

² Published value multiplied by $\eta\pi\pi$ branching ratio 0.49.

³ Published value divided by 2 and multiplied by the $\eta\pi\pi$ branching ratio 0.49.

⁴ Published value multiplied by the $\eta\pi\pi$ branching ratio 0.52.

$f_1(1285)$ BRANCHING RATIOS

$\Gamma(K\bar{K}\pi)/\Gamma(4\pi)$

Γ_{11}/Γ_1

VALUE	DOCUMENT ID	TECN	COMMENT
0.272 ± 0.016 OUR FIT			Error includes scale factor of 1.3.
0.271 ± 0.016 OUR AVERAGE			Error includes scale factor of 1.2.
0.265 ± 0.014	¹ BARBERIS	97C	OMEG 450 $pp \rightarrow p\rho K_S^0 K^\pm \pi^\mp$
0.28 ± 0.05	² ARMSTRONG	89E	OMEG 300 $pp \rightarrow p\rho f_1(1285)$
$0.37 \pm 0.03 \pm 0.05$	³ ARMSTRONG	89G	OMEG 85 $\pi p \rightarrow 4\pi X$

¹ Using $2(\pi^+ \pi^-)$ data from BARBERIS 97B.

² Assuming $\rho\pi\pi$ and $a_0(980)\pi$ intermediate states.

³ 4π consistent with being entirely $\rho\pi\pi$.

$\Gamma(\pi^0 \pi^0 \pi^+ \pi^-)/\Gamma_{\text{total}}$

$\Gamma_2/\Gamma = \frac{2}{3}\Gamma_1/\Gamma$

VALUE	DOCUMENT ID
$0.223^{+0.013}_{-0.012}$ OUR FIT	Error includes scale factor of 1.3.

$\Gamma(2\pi^+ 2\pi^-)/\Gamma_{\text{total}}$

$\Gamma_3/\Gamma = \frac{1}{3}\Gamma_1/\Gamma$

VALUE	DOCUMENT ID
$0.112^{+0.007}_{-0.006}$ OUR FIT	Error includes scale factor of 1.3.

$\Gamma(\rho^0 \pi^+ \pi^-)/\Gamma_{\text{total}}$

$\Gamma_4/\Gamma = \frac{1}{3}\Gamma_1/\Gamma$

VALUE	DOCUMENT ID
$0.112^{+0.007}_{-0.006}$ OUR FIT	Error includes scale factor of 1.3.

$\Gamma(\rho^0 \pi^+ \pi^-)/\Gamma(2\pi^+ 2\pi^-)$

Γ_4/Γ_3

VALUE	DOCUMENT ID	TECN	COMMENT
• • •	We do not use the following data for averages, fits, limits, etc. • • •		
1.0 ± 0.4	GRASSLER	77	HBC 16 GeV $\pi^\pm p$

$\Gamma(\rho^0 \rho^0)/\Gamma_{\text{total}}$

Γ_5/Γ

VALUE	DOCUMENT ID	COMMENT
seen	BARBERIS	00C 450 $pp \rightarrow p_f 4\pi p_s$

$\Gamma(4\pi^0)/\Gamma_{\text{total}}$

Γ_6/Γ

VALUE (units 10^{-4})	CL%	DOCUMENT ID	TECN	COMMENT
<7	90	ALDE	87	GAM4 100 $\pi^- p \rightarrow 4\pi^0 n$

$\Gamma(\pi^+ \pi^- \pi^0)/\Gamma(\eta \pi^+ \pi^-)$

Γ_{13}/Γ_7

VALUE (%)	EVTS	DOCUMENT ID	TECN	COMMENT
$0.86 \pm 0.16 \pm 0.20$	2.3k	¹ DOROFEEV	11	VES $\pi^- N \rightarrow \pi^- f_1(1285) N$

¹ Value obtained selecting the region corresponding to $f_0(980)$ in the $\pi^+ \pi^-$ mass spectrum.

$$\Gamma(\eta\pi\pi)/\Gamma_{\text{total}}$$

$$\Gamma_8/\Gamma = (\Gamma_9+\Gamma_{10})/\Gamma$$

VALUE DOCUMENT ID
0.520^{+0.018}_{-0.021} OUR FIT Error includes scale factor of 1.2.

$$\Gamma(4\pi)/\Gamma(\eta\pi\pi)$$

$$\Gamma_1/\Gamma_8 = \Gamma_1/(\Gamma_9+\Gamma_{10})$$

VALUE DOCUMENT ID TECN COMMENT
0.64^{+0.06}_{-0.05} OUR FIT Error includes scale factor of 1.2.

0.41±0.14 OUR AVERAGE

0.37±0.11±0.11 BOLTON 92 MRK3 $J/\psi \rightarrow \gamma f_1(1285)$

0.64±0.40 GURTU 79 HBC 4.2 $K^- p$

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

0.93±0.30 ¹ GRASSLER 77 HBC 16 $\pi^\mp p$

¹ Assuming $\rho\pi\pi$ and $a_0(980)\pi$ intermediate states.

$$\Gamma(2\pi^+ 2\pi^-)/\Gamma(\eta\pi\pi)$$

$$\Gamma_3/\Gamma_8$$

VALUE DOCUMENT ID TECN COMMENT
0.28±0.02±0.02 ¹ LEES 12X BABR $\tau^- \rightarrow \pi^- f_1(1285) \nu_\tau$

¹ Assuming $B(f_1(1285) \rightarrow \pi\pi\eta) = 3/2 B(f_1(1285) \rightarrow \pi^+ \pi^- \eta)$.

$$\Gamma(a_0(980)\pi [\text{ignoring } a_0(980) \rightarrow K\bar{K}])/ \Gamma(\eta\pi\pi)$$

$$\Gamma_9/\Gamma_8 = \Gamma_9/(\Gamma_9+\Gamma_{10})$$

VALUE CL% DOCUMENT ID TECN COMMENT
0.72±0.08 OUR FIT

0.72±0.07 OUR AVERAGE

0.74±0.02±0.09 DICKSON 16 CLAS $\gamma p \rightarrow f_1(1285) p$

0.72±0.15 GURTU 79 HBC 4.2 $K^- p$

0.6 ^{+0.3}_{-0.2} CORDEN 78 OMEG 12–15 $\pi^- p$

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

>0.69 95 ACHARD 02B L3 183–209 $e^+ e^- \rightarrow e^+ e^- \eta \pi^+ \pi^-$

0.28±0.07 ALDE 97B GAM4 100 $\pi^- p \rightarrow \eta \pi^0 \pi^0 n$

1.0 ±0.3 GRASSLER 77 HBC 16 $\pi^\mp p$

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

$$\Gamma_{11}/\Gamma_8 = \Gamma_{11}/(\Gamma_9+\Gamma_{10})$$

VALUE DOCUMENT ID TECN COMMENT
0.176±0.012 OUR FIT Error includes scale factor of 1.1.

0.176±0.012 OUR AVERAGE

0.216±0.010±0.031 DICKSON 16 CLAS $\gamma p \rightarrow f_1(1285) p$

0.166±0.01 ±0.008 BARBERIS 98C OMEG 450 $pp \rightarrow p_f f_1(1285) p_s$

0.42 ±0.15 GURTU 79 HBC 4.2 $K^- p$

0.5 ±0.2 ¹ CORDEN 78 OMEG 12–15 $\pi^- p$

0.20 ±0.08 ² DEFOIX 72 HBC 0.7 $\bar{p} p \rightarrow 7\pi$

0.16 ±0.08 CAMPBELL 69 DBC 2.7 $\pi^+ d$

¹ CORDEN 78 assumes low-mass $\eta\pi\pi$ region is dominantly 1^{++} . See BARBERIS 98C and MANAK 00A for discussion.

² $K\bar{K}$ system characterized by the $l = 1$ threshold enhancement. (See under $a_0(980)$).

$\Gamma(K\bar{K}^*(892))/\Gamma_{\text{total}}$ Γ_{12}/Γ

VALUE	DOCUMENT ID	TECN	COMMENT
not seen	NACASCH	78	HBC 0.7,0.76 $\bar{p}p \rightarrow K\bar{K}3\pi$
••• We do not use the following data for averages, fits, limits, etc. •••			
seen	¹ ACHARD	07	L3 183-209 $e^+e^- \rightarrow e^+e^-K_S^0K^\pm\pi^\mp$

¹ A clear signal of 19.8 ± 4.4 events observed at high Q^2 .

$\Gamma(\pi^+\pi^-\pi^0)/\Gamma_{\text{total}}$ Γ_{13}/Γ

VALUE (%)	EVTS	DOCUMENT ID	TECN	COMMENT
0.30±0.055±0.074	2.3k	¹ DOROFEEV	11	VES $\pi^-N \rightarrow \pi^-f_1(1285)N$

¹ Value obtained selecting the region corresponding to $f_0(980)$ in the $\pi^+\pi^-$ mass spectrum. The systematic error includes the uncertainty on the partial width $f_1 \rightarrow \eta\pi\pi$ obtained from PDG 10 data.

$\Gamma(\rho^\pm\pi^\mp)/\Gamma_{\text{total}}$ Γ_{14}/Γ

VALUE (%)	CL%	DOCUMENT ID	TECN	COMMENT
<0.31	95	DOROFEEV	11	VES $\pi^-N \rightarrow \pi^-f_1(1285)N$

$\Gamma(\gamma\rho^0)/\Gamma_{\text{total}}$ Γ_{15}/Γ

VALUE (units 10^{-2})	CL%	DOCUMENT ID	TECN	COMMENT
5.3±1.2 OUR FIT				Error includes scale factor of 2.9.
2.8±0.7±0.6		AMELIN	95	VES 37 $\pi^-N \rightarrow \pi^-\pi^+\pi^-\gamma N$
••• We do not use the following data for averages, fits, limits, etc. •••				
<5	95	BITYUKOV	91B	SPEC 32 $\pi^-p \rightarrow \pi^+\pi^-\gamma n$

$\Gamma(\gamma\rho^0)/\Gamma(2\pi^+2\pi^-)$ $\Gamma_{15}/\Gamma_3 = \Gamma_{15}/\frac{1}{3}\Gamma_1$

VALUE	DOCUMENT ID	TECN	COMMENT
0.48±0.13 OUR FIT			Error includes scale factor of 2.5.
0.45±0.18	¹ COFFMAN	90	MRK3 $J/\psi \rightarrow \gamma\gamma\pi^+\pi^-$

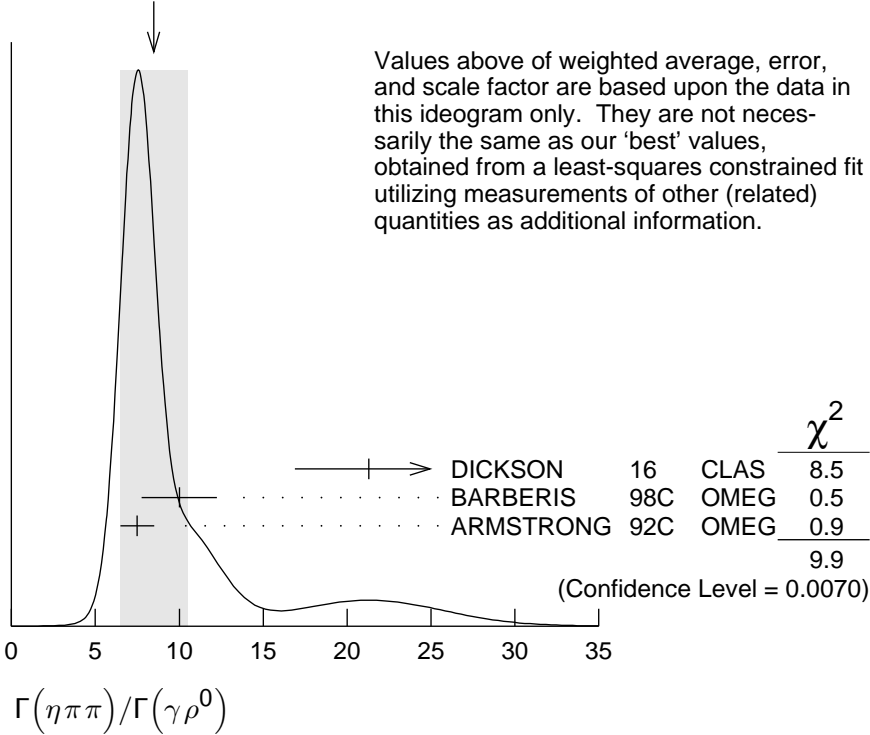
¹ Using $B(J/\psi \rightarrow \gamma f_1(1285) \rightarrow \gamma\gamma\rho^0) = 0.25 \times 10^{-4}$ and $B(J/\psi \rightarrow \gamma f_1(1285) \rightarrow \gamma 2\pi^+2\pi^-) = 0.55 \times 10^{-4}$ given by MIR 88.

$\Gamma(\eta\pi\pi)/\Gamma(\gamma\rho^0)$ $\Gamma_8/\Gamma_{15} = (\Gamma_9+\Gamma_{10})/\Gamma_{15}$

VALUE	DOCUMENT ID	TECN	COMMENT
9.7±1.9 OUR FIT			Error includes scale factor of 2.4.
8.5±2.0 OUR AVERAGE			Error includes scale factor of 2.2. See the ideogram below.
21.3±4.4	DICKSON	16	CLAS $\gamma p \rightarrow f_1(1285)p$
10.0±1.0±2.0	BARBERIS	98C	OMEG 450 $pp \rightarrow p_f f_1(1285) p_s$
7.5±1.0	¹ ARMSTRONG	92C	OMEG 300 $pp \rightarrow pp\pi^+\pi^-\gamma, pp\eta\pi^+\pi^-$

¹ Published value multiplied by 1.5.

WEIGHTED AVERAGE
8.5±2.0 (Error scaled by 2.2)



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

Γ_{15}/Γ_{11}

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

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

>0.035	90	¹ COFFMAN	90	MRK3 $J/\psi \rightarrow \gamma\gamma\pi^+\pi^-$
--------	----	----------------------	----	--

¹ Using $B(J/\psi \rightarrow \gamma f_1(1285) \rightarrow \gamma\gamma\rho^0) = 0.25 \times 10^{-4}$ and $B(J/\psi \rightarrow \gamma f_1(1285) \rightarrow \gamma K\bar{K}\pi) < 0.72 \times 10^{-3}$.

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

Γ_{16}/Γ_{11}

VALUE (units 10^{-2})	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
--------------------------	-----	------	-------------	------	---------

0.82±0.21±0.20		19	BITYUKOV	88	SPEC $32.5 \pi^- p \rightarrow K^+ K^- \pi^0 n$
-----------------------	--	----	----------	----	---

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

<0.50	95	BARBERIS	98C	OMEG	450 $pp \rightarrow p_f f_1(1285) p_S$
-------	----	----------	-----	------	--

<0.93	95	AMELIN	95	VES	37 $\pi^- N \rightarrow \pi^- \pi^+ \pi^- \gamma N$
-------	----	--------	----	-----	---

$f_1(1285)$ REFERENCES

DICKSON	16	PR C93 065202	R. Dickson <i>et al.</i>	(JLab CLAS Collab.)
ABLIKIM	15P	PR D92 012007	M. Ablikim <i>et al.</i>	(BES III Collab.)
AAIJ	14Y	PRL 112 091802	R. Aaij <i>et al.</i>	(LHCb Collab.)
LEES	12X	PR D86 092010	J.P. Lees <i>et al.</i>	(BABAR Collab.)
ABLIKIM	11J	PRL 107 182001	M. Ablikim <i>et al.</i>	(BES III Collab.)
DOROFEEV	11	EPJ A47 68	V. Dorofeev <i>et al.</i>	(SERP, MIPT)
PDG	10	JP G37 075021	K. Nakamura <i>et al.</i>	(PDG Collab.)
ACHARD	07	JHEP 0703 018	P. Achard <i>et al.</i>	(L3 Collab.)
AUBERT	07AU	PR D76 092005	B. Aubert <i>et al.</i>	(BABAR Collab.)

BAI	04J	PL B594 47	J.Z. Bai <i>et al.</i>	(BES Collab.)
ABDALLAH	03H	PL B569 129	J. Abdallah <i>et al.</i>	(DELPHI Collab.)
ACHARD	02B	PL B526 269	P. Achard <i>et al.</i>	(L3 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.)
BARBERIS	00C	PL B471 440	D. Barberis <i>et al.</i>	(WA 102 Collab.)
MANAK	00A	PR D62 012003	J.J. Manak <i>et al.</i>	(BNL E852 Collab.)
SOSA	99	PRL 83 913	M. Sosa <i>et al.</i>	
BARBERIS	98C	PL B440 225	D. Barberis <i>et al.</i>	(WA 102 Collab.)
ALDE	97B	PAN 60 386	D. Alde <i>et al.</i>	(GAMS Collab.)
		Translated from YAF 60 458.		
BARBERIS	97B	PL B413 217	D. Barberis <i>et al.</i>	(WA 102 Collab.)
BARBERIS	97C	PL B413 225	D. Barberis <i>et al.</i>	(WA 102 Collab.)
AMELIN	95	ZPHY C66 71	D.V. Amelin <i>et al.</i>	(VES Collab.)
ANTINORI	95	PL B353 589	F. Antinori <i>et al.</i>	(ATHU, BARI, BIRM+)
ABATZIS	94	PL B324 509	S. Abatzis <i>et al.</i>	(ATHU, BARI, BIRM+)
LEE	94	PL B323 227	J.H. Lee <i>et al.</i>	(BNL, IND, KYUN, MASD+)
ARMSTRONG	93C	PL B307 394	T.A. Armstrong <i>et al.</i>	(FNAL, FERR, GENO+)
ARMSTRONG	92C	ZPHY C54 371	T.A. Armstrong <i>et al.</i>	(ATHU, BARI, BIRM+)
BOLTON	92	PL B278 495	T. Bolton <i>et al.</i>	(Mark III Collab.)
BITYUKOV	91B	SJNP 54 318	S.I. Bityukov <i>et al.</i>	(SERP)
		Translated from YAF 54 529.		
FUKUI	91C	PL B267 293	S. Fukui <i>et al.</i>	(SUGI, NAGO, KEK, KYOT+)
COFFMAN	90	PR D41 1410	D.M. Coffman <i>et al.</i>	(Mark III Collab.)
ARMSTRONG	89	PL B221 216	T.A. Armstrong <i>et al.</i>	(CERN, CDEF, BIRM+) JPC
ARMSTRONG	89E	PL B228 536	T.A. Armstrong, M. Benayoun	(ATHU, BARI, BIRM+)
ARMSTRONG	89G	ZPHY C43 55	T.A. Armstrong <i>et al.</i>	(CERN, BIRM, BARI+)
RATH	89	PR D40 693	M.G. Rath <i>et al.</i>	(NDAM, BRAN, BNL, CUNY+)
AIHARA	88B	PL B209 107	H. Aihara <i>et al.</i>	(TPC-2 γ Collab.)
BIRMAN	88	PRL 61 1557	A. Birman <i>et al.</i>	(BNL, FSU, IND, MASD) JP
BITYUKOV	88	PL B203 327	S.I. Bityukov <i>et al.</i>	(SERP)
MIR	88	Photon-Photon 88, 126	R. Mir	(Mark III Collab.)
Conference				
ALDE	87	PL B198 286	D.M. Alde <i>et al.</i>	(LANL, BRUX, SERP, LAPP)
BECKER	87	PRL 59 186	J.J. Becker <i>et al.</i>	(Mark III Collab.)
GIDAL	87	PRL 59 2012	G. Gidal <i>et al.</i>	(LBL, SLAC, HARV)
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
ARMSTRONG	84	PL 146B 273	T.A. Armstrong <i>et al.</i>	(ATHU, BARI, BIRM+) JP
BITYUKOV	84B	PL 144B 133	S.I. Bityukov <i>et al.</i>	(SERP)
CHAUVAT	84	PL 148B 382	P. Chauvat <i>et al.</i>	(CERN, CLER, UCLA+)
TORNQVIST	82B	NP B203 268	N.A. Tornqvist	(HELS)
EVANGELIS...	81	NP B178 197	C. Evangelista <i>et al.</i>	(BARI, BONN, CERN+)
BROMBERG	80	PR D22 1513	C.M. Bromberg <i>et al.</i>	(CIT, FNAL, ILLC+)
DIONISI	80	NP B169 1	C. Dionisi <i>et al.</i>	(CERN, MADR, CDEF+)
GURTU	79	NP B151 181	A. Gurtu <i>et al.</i>	(CERN, ZEEM, NIJM, OXF)
STANTON	79	PRL 42 346	N.R. Stanton <i>et al.</i>	(OSU, CARL, MCGI+) JP
CORDEN	78	NP B144 253	M.J. Corden <i>et al.</i>	(BIRM, RHEL, TELA+) JP
NACASCH	78	NP B135 203	R. Nacasch <i>et al.</i>	(PARIS, MADR, CERN)
GRASSLER	77	NP B121 189	H. Grassler <i>et al.</i>	(AACH3, BERL, BONN+)
DEFOIX	72	NP B44 125	C. Defoix <i>et al.</i>	(CDEF, CERN)
DUBOC	72	NP B46 429	J. Duboc <i>et al.</i>	(PARIS, LIVP)
THUN	72	PRL 28 1733	R. Thun <i>et al.</i>	(STON, NEAS)
BARADIN-...	71	PR D4 2711	M. Bardadin-Otwinowska <i>et al.</i>	(WARS)
BOESEBECK	71	PL 34B 659	K. Boesebeck	(AACH, BERL, BONN, CERN, CRAC+)
CAMPBELL	69	PRL 22 1204	J.H. Campbell <i>et al.</i>	(PURD)
LORSTAD	69	NP B14 63	B. Lorstad <i>et al.</i>	(CDEF, CERN) JP
D'ANDLAU	68	NP B5 693	C. d'Andlau <i>et al.</i>	(CDEF, CERN, IRAD+) IJP
DAHL	67	PR 163 1377	O.I. Dahl <i>et al.</i>	(LRL) IJP