$f_1(1285)$

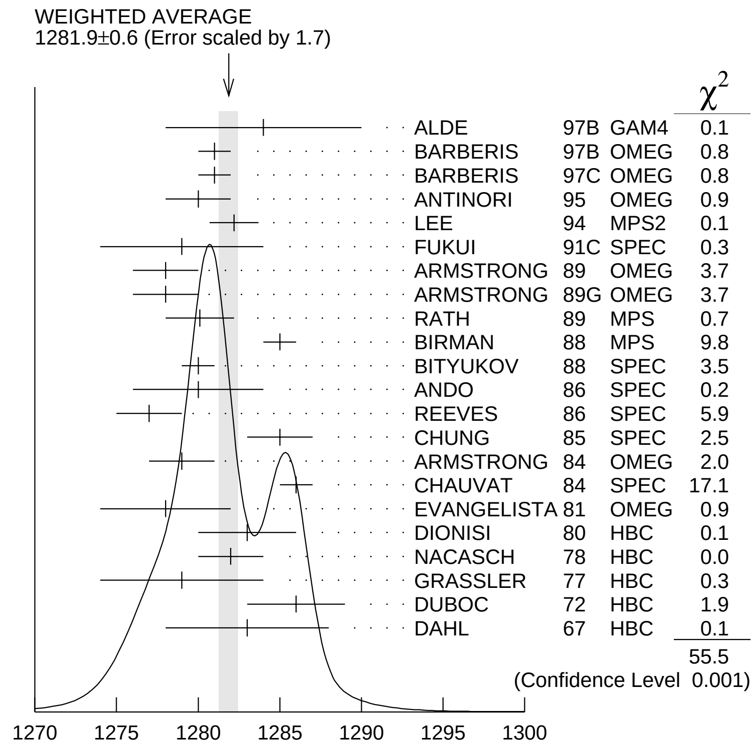
$I^G(J^{PC}) = 0^+(1^{++})$

$f_1(1285)$ MASS

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	COMMENT
1281.9± 0.6 OUR AVERAGE		Error includes scale factor of 1.7. See the ideogram below.			
1284 ± 6	1400	ALDE	97B	GAM4	100 $\pi^- p \to \eta \pi^0 \pi^0 n$
1281 ± 1		BARBERIS	97B	OMEG	450 $p p \to p p 2(\pi^+ \pi^-)$
1281 ± 1		BARBERIS	97C	OMEG	450 $p p \to p p K^0_S K^\pm \pi^\mp$
1280 ± 2		[1] ANTINORI	95	OMEG	300,450 $p p \to p p 2(\pi^+ \pi^-)$
1282.2± 1.5		LEE	94	MPS2	18 $\pi^- p \to K^+ \overline{K}^0 2\pi^- p$
1279 ± 5		FUKUI	91C	SPEC	8.95 $\pi^- p \to \eta \pi^+ \pi^- n$
1278 ± 2	140	ARMSTRONG	89	OMEG	300 $p p \to K \overline{K} \pi p p$
1278 ± 2		ARMSTRONG	89G	OMEG	85 $\pi^+ p \to 4\pi \pi p$, $p p \to 4\pi p p$
1280.1± 2.1	60	RATH	89	MPS	21.4 $\pi^- p \to K^0_S K^0_S \pi^0 n$
1285 ± 1	4750	[2] BIRMAN	88	MPS	8 $\pi^- p \to K^+ \overline{K}^0 \pi^- n$
1280 ± 1	504	BITYUKOV	88	SPEC	32.5 $\pi^- p \to K^+ K^- \pi^0 n$
1280 ± 4		ANDO	86	SPEC	8 $\pi^- p \to \eta \pi^+ \pi^- n$
1277 ± 2	420	REEVES	86	SPEC	6.6 $p \overline{p} \to K K \pi X$
1285 ± 2		CHUNG	85	SPEC	8 $\pi^- p \to N K \overline{K} \pi$
1279 ± 2	604	ARMSTRONG	84	OMEG	85 $\pi^+ p \to K \overline{K} \pi \pi p$, $p p \to K \overline{K} \pi p p$
1286 ± 1		CHAUVAT	84	SPEC	ISR 31.5 $p p$
1278 ± 4		EVANGELISTA	81	OMEG	12 $\pi^- p \to \eta \pi^+ \pi^- \pi^- p$
1283 ± 3	103	DIONISI	80	HBC	4 $\pi^- p \to K \overline{K} \pi n$
1282 ± 2	320	NACASCH	78	HBC	0.7,0.76 $\overline{p} p \to K \overline{K} 3\pi$
1279 ± 5	210	GRASSLER	77	HBC	16 $\pi^\mp p$
1286 ± 3	180	DUBOC	72	HBC	1.2 $\overline{p} p \to 2K 4\pi$
1283 ± 5		DAHL	67	HBC	1.6–4.2 $\pi^- p$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
1281.9± 0.5		[3] SOSA	99	SPEC	$p p \to p_{slow} (K^0_S K^+ \pi^-) p_{fast}$
1282.8± 0.6		[3] SOSA	99	SPEC	$p p \to p_{slow} (K^0_S K^- \pi^+) p_{fast}$
1270 ±10		AMELIN	95	VES	37 $\pi^- N \to \pi^- \pi^+ \pi^- \gamma N$
1280 ± 2		ABATZIS	94	OMEG	450 $p p \to p p 2(\pi^+ \pi^-)$
1282 ± 4		ARMSTRONG	93C	E760	$\overline{p} p \to \pi^0 \eta \eta \to 6\gamma$
1270 ± 6 ±10		ARMSTRONG	92C	OMEG	300 $p p \to p p \pi^+ \pi^- \gamma$

1264 ± 8			AUGUSTIN	90	DM2	$J/\psi \to \gamma\eta\pi^+\pi^-$
1281 ± 1			ARMSTRONG	89E	OMEG	300 $pp \to pp2(\pi^+\pi^-)$
1279 ± 6 ±10	16		BECKER	87	MRK3	$e^+e^- \to \phi K\overline{K}\pi$
1286 ± 9			GIDAL	87	MRK2	$e^+e^- \to e^+e^-\eta\pi^+\pi^-$
1287 ± 5	353		BITYUKOV	84B	SPEC	32 $\pi^-p \to K^+K^-\pi^0 n$
~ 1279		4	TORNQVIST	82B	RVUE	
1275 ± 6	31		BROMBERG	80	SPEC	100 $\pi^-p \to K\overline{K}\pi X$
1288 ± 9	200		GURTU	79	HBC	4.2 $K^-p \to n\eta 2\pi$
~ 1275.0	46	5	STANTON	79	CNTR	8.5 $\pi^-p \to n2\gamma 2\pi$
1271 ±10	34		CORDEN	78	OMEG	12–15 $\pi^-p \to K^+K^-\pi n$
1295 ±12	85		CORDEN	78	OMEG	12–15 $\pi^-p \to n5\pi$
1292 ±10	150		DEFOIX	72	HBC	0.7 $\overline{p}p \to 7\pi$
1280 ± 3	500	6	THUN	72	MMS	13.4 π^-p
1303 ± 8			BARDADIN-...	71	HBC	8 $\pi^+p \to p6\pi$
1283 ± 6			BOESEBECK	71	HBC	16.0 $\pi p \to p5\pi$
1270 ±10			CAMPBELL	69	DBC	2.7 π^+d
1285 ± 7			LORSTAD	69	HBC	0.7 $\overline{p}p$, 4,5-body
1290 ± 7			D'ANDLAU	68	HBC	1.2 $\overline{p}p$, 5–6 body

[1] Supersedes ABATZIS 94, ARMSTRONG 89E.
[2] From partial wave analysis of $K^+\overline{K}^0\pi^-$ system.
[3] No systematic error given.
[4] From a unitarized quark-model calculation.
[5] From phase shift analysis of $\eta\pi^+\pi^-$ system.
[6] Seen in the missing mass spectrum.



$f_1(1285)$ mass (MeV)

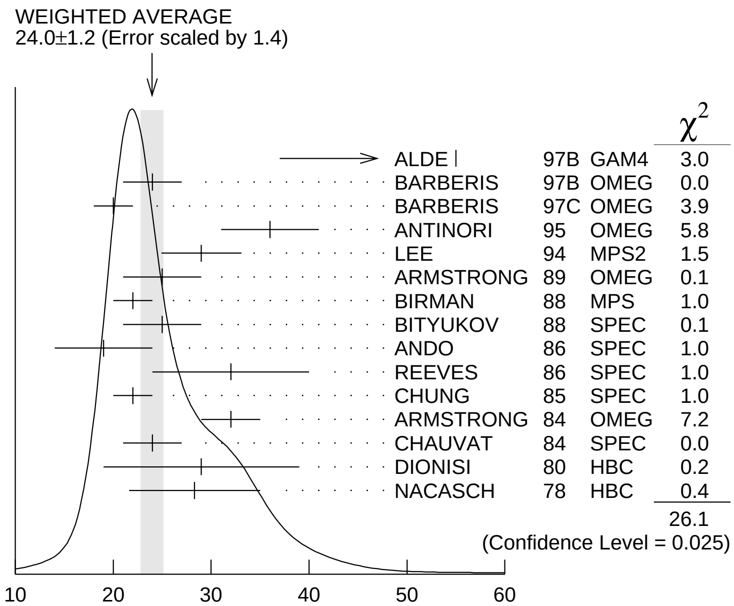
$f_1(1285)$ WIDTH

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

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
24.0± 1.2 OUR AVERAGE		Error includes scale factor of 1.4. See the ideogram below.		
55 ±18	1400	ALDE 97B	GAM4	100 $\pi^- p \to \eta\pi^0\pi^0 n$
24 ± 3		BARBERIS 97B	OMEG	450 $pp \to pp2(\pi^+\pi^-)$
20 ± 2		BARBERIS 97C	OMEG	450 $pp \to ppK^0_S K^\pm\pi^\mp$
36 ± 5		[7] ANTINORI 95	OMEG	300,450 $pp \to pp2(\pi^+\pi^-)$
29.0± 4.1		LEE 94	MPS2	18 $\pi^- p \to K^+\overline{K}^0 2\pi^- p$
25 ± 4	140	ARMSTRONG 89	OMEG	300 $pp \to K\overline{K}\pi pp$
22 ± 2	4750	[8] BIRMAN 88	MPS	8 $\pi^- p \to K^+\overline{K}^0\pi^- n$
25 ± 4	504	BITYUKOV 88	SPEC	32.5 $\pi^- p \to K^+K^-\pi^0 n$

19 ± 5		ANDO	86	SPEC	8 $\pi^- p \rightarrow \eta\pi^+\pi^- n$
32 ± 8	420	REEVES	86	SPEC	6.6 $p\overline{p} \rightarrow KK\pi X$
22 ± 2		CHUNG	85	SPEC	8 $\pi^- p \rightarrow NK\overline{K}\pi$
32 ± 3	604	ARMSTRONG	84	OMEG	85 $\pi^+ p \rightarrow K\overline{K}\pi\pi p$, $pp \rightarrow K\overline{K}\pi pp$
24 ± 3		CHAUVAT	84	SPEC	ISR 31.5 pp
29 ±10	103	DIONISI	80	HBC	4 $\pi^- p \rightarrow K\overline{K}\pi n$
28.3± 6.7	320	NACASCH	78	HBC	0.7,0.76 $\overline{p}p \rightarrow K\overline{K}3\pi$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
18.2± 1.2		[9] SOSA	99	SPEC	$pp \rightarrow p_{\text{slow}} (K^0_S K^+\pi^-) p_{\text{fast}}$
19.4± 1.5		[9] SOSA	99	SPEC	$pp \rightarrow p_{\text{slow}} (K^0_S K^-\pi^+) p_{\text{fast}}$
40 ± 5		ABATZIS	94	OMEG	450 $pp \rightarrow pp2(\pi^+\pi^-)$
44 ±20		AUGUSTIN	90	DM2	$J/\psi \rightarrow \gamma\eta\pi^+\pi^-$
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 $\pi^- p \rightarrow K^0_S K^0_S \pi^0 n$
14 $^{+20}_{-14}$ ±10	16	BECKER	87	MRK3	$e^+e^- \rightarrow \phi K\overline{K}\pi$
26 ±12		EVANGELISTA	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		[10] 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	[11] DEFOIX	72	HBC	0.7 $\overline{p}p \rightarrow 7\pi$
46 ± 9	180	[11] DUBOC	72	HBC	1.2 $\overline{p}p \rightarrow 2K4\pi$
37 ± 5	500	[12] 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		[11] LORSTAD	69	HBC	0.7 $\overline{p}p$, 4,5-body
35 ±10		[11] DAHL	67	HBC	1.6–4.2 $\pi^- p$

[7] Supersedes ABATZIS 94, ARMSTRONG 89E.
[8] From partial wave analysis of $K^+\overline{K}^0\pi^-$ system.
[9] No systematic error given.
[10] From phase shift analysis of $\eta\pi^+\pi^-$ system.
[11] Resolution is not unfolded.
[12] Seen in the missing mass spectrum.



$f_1(1285)$ width (MeV)

$f_1(1285)$ DECAY MODES

	Mode	Fraction (Γ_i/Γ)	Scale factor/ Confidence level
Γ_1	4π	$(33.1^{+2.1}_{-1.8})$ %	S=1.3
Γ_2	$\pi^0\pi^0\pi^+\pi^-$	$(22.0^{+1.4}_{-1.2})$ %	S=1.3
Γ_3	$2\pi^+2\pi^-$	$(11.0^{+0.7}_{-0.6})$ %	S=1.3
Γ_4	$\rho^0\pi^+\pi^-$	$(11.0^{+0.7}_{-0.6})$ %	S=1.3
Γ_5	$\rho^0\rho^0$	seen	
Γ_6	$4\pi^0$	$< 7 \times 10^{-4}$	CL=90%
Γ_7	$\eta\pi\pi$	(52 ± 16) %	
Γ_8	$a_0(980)\pi$ [ignoring $a_0(980) \to K\overline{K}$]	(36 ± 7) %	
Γ_9	$\eta\pi\pi$ [excluding $a_0(980)\pi$]	(16 ± 7) %	
Γ_{10}	$K\overline{K}\pi$	(9.0 ± 0.4) %	S=1.1
Γ_{11}	$K\overline{K}^*(892)$	not seen	
Γ_{12}	$\gamma\rho^0$	(5.5 ± 1.3) %	S=2.8
Γ_{13}	$\phi\gamma$	$(7.4 \pm 2.6) \times 10^{-4}$	
Γ_{14}	$\gamma\gamma^*$		
Γ_{15}	$\gamma\gamma$		

CONSTRAINED FIT INFORMATION

An overall fit to 7 branching ratios uses 16 measurements and one constraint to determine 5 parameters. The overall fit has a $\chi^2 =$ 24.7 for 12 degrees of freedom.

The following *off-diagonal* array elements are the correlation coefficients $\left\langle\delta x_i\delta x_j\right\rangle/(\delta x_i\cdot\delta x_j)$, 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_8	−17			
x_9	−8	−95		
x_{10}	46	−9	−4	
x_{12}	−36	−4	−2	−34
	x_1	x_8	x_9	x_{10}

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

$\Gamma(\eta\pi\pi) \times \Gamma(\gamma\gamma)/\Gamma_{\text{total}}$ — $\Gamma_7\Gamma_{15}/\Gamma = (\Gamma_8+\Gamma_9)\Gamma_{15}/\Gamma$

VALUE (keV)	*CL%*	*DOCUMENT ID*		*TECN*	*COMMENT*
<0.62	95	GIDAL	87	MRK2	$e^+e^- \rightarrow e^+e^-\eta\pi^+\pi^-$

$\Gamma(\eta\pi\pi) \times \Gamma(\gamma\gamma^*)/\Gamma_{\text{total}}$ — $\Gamma_7\Gamma_{14}/\Gamma = (\Gamma_8+\Gamma_9)\Gamma_{14}/\Gamma$

VALUE (keV)	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
1.4 ±0.4 OUR AVERAGE	Error includes scale factor of 1.4.				
1.18±0.25±0.20	26	[13,14] AIHARA	88B	TPC	$e^+e^- \rightarrow e^+e^-\eta\pi^+\pi^-$
2.30±0.61±0.42		[13,15] GIDAL	87	MRK2	$e^+e^- \rightarrow e^+e^-\eta\pi^+\pi^-$

[13] Assuming a ρ-pole form factor.
[14] Published value multiplied by $\eta\pi\pi$ branching ratio 0.49.
[15] Published value divided by 2 and multiplied by the $\eta\pi\pi$ branching ratio 0.49.

$f_1(1285)$ BRANCHING RATIOS

$\Gamma(K\overline{K}\pi)/\Gamma(4\pi)$ — Γ_{10}/Γ_1

VALUE	*DOCUMENT ID*		*TECN*	*COMMENT*
0.271±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	[16] BARBERIS	97C	OMEG	450 $pp \rightarrow ppK^0_S K^\pm\pi^\mp$
0.28 ±0.05	[17] ARMSTRONG	89E	OMEG	300 $pp \rightarrow ppf_1(1285)$
0.37 ±0.03 ±0.05	[18] ARMSTRONG	89G	OMEG	85 $\pi p \rightarrow 4\pi X$

[16] Using $2(\pi^+\pi^-)$ data from BARBERIS 97B.
[17] Assuming $\rho\pi\pi$ and $a_0(980)\pi$ intermediate states.
[18] 4π consistent with being entirely $\rho\pi\pi$.

$\Gamma(\pi^0\pi^0\pi^+\pi^-)/\Gamma_{total}$ — $\Gamma_2/\Gamma = \frac{2}{3}\Gamma_1/\Gamma$

VALUE	DOCUMENT ID
$\mathbf{0.220^{+0.014}_{-0.012}}$ **OUR FIT** Error includes scale factor of 1.3.	

$\Gamma(2\pi^+2\pi^-)/\Gamma_{total}$ — $\Gamma_3/\Gamma = \frac{1}{3}\Gamma_1/\Gamma$

VALUE	DOCUMENT ID
$\mathbf{0.110^{+0.007}_{-0.006}}$ **OUR FIT** Error includes scale factor of 1.3.	

$\Gamma(\rho^0\pi^+\pi^-)/\Gamma_{total}$ — $\Gamma_4/\Gamma = \frac{1}{3}\Gamma_1/\Gamma$

VALUE	DOCUMENT ID
$\mathbf{0.110^{+0.007}_{-0.006}}$ **OUR FIT** Error includes scale factor of 1.3.	

$\Gamma(\rho^0\rho^0)/\Gamma_{total}$ — Γ_5/Γ

VALUE	DOCUMENT ID		COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •			
seen	BARBERIS	00C	450 $pp \to p_f 4\pi p_s$

$\Gamma(K\overline{K}\pi)/\Gamma(\eta\pi\pi)$ — $\Gamma_{10}/\Gamma_7 = \Gamma_{10}/(\Gamma_8+\Gamma_9)$

VALUE	DOCUMENT ID		TECN	COMMENT
0.171±0.013 OUR FIT Error includes scale factor of 1.1.				
0.170±0.012 OUR AVERAGE				
0.166±0.01 ±0.008	BARBERIS	98C	OMEG	450 $pp \to p_f f_1(1285) p_s$
0.42 ±0.15	GURTU	79	HBC	4.2 $K^- p$
0.5 ±0.2	[19] CORDEN	78	OMEG	12–15 $\pi^- p$
0.20 ±0.08	[20] DEFOIX	72	HBC	0.7 $\overline{p}p \to 7\pi$
0.16 ±0.08	CAMPBELL	69	DBC	2.7 $\pi^+ d$

[19] CORDEN 78 assumes low-mass $\eta\pi\pi$ region is dominantly 1^{++}. See BARBERIS 98C and MANAK 00A for discussion.
[20] $K\overline{K}$ system characterized by the $I = 1$ threshold enhancement. (See under $a_0(980)$).

$\Gamma(a_0(980)\pi\ [\text{ignoring } a_0(980) \to K\overline{K}])/\Gamma(\eta\pi\pi)$ — $\Gamma_8/\Gamma_7 = \Gamma_8/(\Gamma_8+\Gamma_9)$

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.69±0.13 OUR FIT					
$\mathbf{0.69^{+0.13}_{-0.12}}$ **OUR AVERAGE**					
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. • • •					
0.28±0.07	1400	ALDE	97B	GAM4	100 $\pi^- p \to \eta\pi^0\pi^0 n$
1.0 ±0.3		GRASSLER	77	HBC	16 $\pi^\mp p$

$\Gamma(4\pi)/\Gamma(\eta\pi\pi)$ — $\Gamma_1/\Gamma_7 = \Gamma_1/(\Gamma_8+\Gamma_9)$

VALUE	DOCUMENT ID		TECN	COMMENT
0.63±0.06 OUR FIT Error includes scale factor of 1.2.				
0.41±0.14 OUR AVERAGE				
0.37±0.11±0.11	BOLTON	92	MRK3	$J/\psi \to \gamma f_1(1285)$
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	[21] GRASSLER	77	HBC	16 $\pi^\mp p$

[21] Assuming $\rho\pi\pi$ and $a_0(980)\pi$ intermediate states.

$\Gamma(K\overline{K}^*(892))/\Gamma_{total}$ — Γ_{11}/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
not seen	NACASCH	78	HBC	0.7,0.76 $\overline{p}p \to K\overline{K}3\pi$

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

$\Gamma(4\pi^0)/\Gamma_{total}$ — Γ_6/Γ

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

$\Gamma(\phi\gamma)/\Gamma(K\overline{K}\pi)$ — Γ_{13}/Γ_{10}

VALUE (units 10^{-2})	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
0.82±0.21±0.20		19	BITYUKOV	88	SPEC	32.5 $\pi^- p \to K^+K^-\pi^0 n$
• • • We do not use the following data for averages, fits, limits, etc. • • •						
<0.50	95		BARBERIS	98C	OMEG	450 $pp \to p_f f_1(1285) p_s$
<0.93	95		AMELIN	95	VES	37 $\pi^- N \to \pi^-\pi^+\pi^-\gamma N$

$\Gamma(\gamma\rho^0)/\Gamma(K\overline{K}\pi)$ — Γ_{12}/Γ_{10}

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
>0.035	90	[22] COFFMAN	90	MRK3	$J/\psi \to \gamma\gamma\pi^+\pi^-$

[22] Using B($J/\psi \to \gamma f_1(1285) \to \gamma\gamma\rho^0$)=0.25 × 10^{-4} and B($J/\psi \to \gamma f_1(1285) \to \gamma K\overline{K}\pi$)=< 0.72 × 10^{-3}.

$\Gamma(\gamma\rho^0)/\Gamma(2\pi^+2\pi^-)$ — $\Gamma_{12}/\Gamma_3 = \Gamma_{12}/\frac{1}{3}\Gamma_1$

VALUE	DOCUMENT ID		TECN	COMMENT
0.50±0.13 OUR FIT Error includes scale factor of 2.5.				
0.45±0.18	[23] COFFMAN	90	MRK3	$J/\psi \to \gamma\gamma\pi^+\pi^-$

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

$\Gamma(\gamma\rho^0)/\Gamma_{total}$ — Γ_{12}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
0.055±0.013 OUR FIT Error includes scale factor of 2.8.					
0.028±0.007±0.006		AMELIN	95	VES	37 $\pi^- N \to \pi^-\pi^+\pi^-\gamma N$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.05	95	BITYUKOV	91B	SPEC	32 $\pi^- p \to \pi^+\pi^-\gamma n$

$\Gamma(\eta\pi\pi)/\Gamma(\gamma\rho^0)$ — $\Gamma_7/\Gamma_{12} = (\Gamma_8+\Gamma_9)/\Gamma_{12}$

VALUE	DOCUMENT ID		TECN	COMMENT
9.5±2.0 OUR FIT Error includes scale factor of 2.5.				
7.9±0.9 OUR AVERAGE				
10.0±1.0±2.0	BARBERIS	98C	OMEG	450 $pp \to p_f f_1(1285) p_s$
7.5±1.0	[24] ARMSTRONG	92C	OMEG	300 $pp \to pp\pi^+\pi^-\gamma$, $pp\eta\pi^+\pi^-$

[24] Published value multiplied by 1.5.

$f_1(1285)$ REFERENCES

BARBERIS	00C	PL B471 440	D. Barberis et al.	(WA 102 Collab.)
MANAK	00A	PR D62 012003	J.J. Manak et al.	
SOSA	99	PRL 83 913	M. Sosa et al.	
BARBERIS	98C	PL B440 225	D. Barberis et al.	(WA 102 Collab.)
ALDE	97B	PAN 60 386	D. Alde et al.	(GAMS Collab.)
		Translated from YAF 60 458.		
BARBERIS	97B	PL B413 217	D. Barberis et al.	(WA 102 Collab.)
BARBERIS	97C	PL B413 225	D. Barberis et al.	(WA 102 Collab.)
AMELIN	95	ZPHY C66 71	D.V. Amelin et al.	(VES Collab.)
ANTINORI	95	PL B353 589	F. Antinori et al.	(ATHU, BARI, BIRM+)
ABATZIS	94	PL B324 509	S. Abatzis et al.	(ATHU, BARI, BIRM+)
LEE	94	PL B323 227	J.H. Lee et al.	(BNL, IND, KYUN, MASD+)
ARMSTRONG	93C	PL B307 394	T.A. Armstrong et al.	(FNAL, FERR, GENO+)
ARMSTRONG	92C	ZPHY C54 371	T.A. Armstrong et al.	(ATHU, BARI, BIRM+)
BOLTON	92	PL B278 495	T. Bolton et al.	(Mark III Collab.)
BITYUKOV	91B	SJNP 54 318	S.I. Bityukov et al.	(SERP)
		Translated from YAF 54 529.		
FUKUI	91C	PL B267 293	S. Fukui et al.	(SUGI, NAGO, KEK, KYOT+)
AUGUSTIN	90	PR D42 10	J.E. Augustin et al.	(DM2 Collab.)
COFFMAN	90	PR D41 1410	D.M. Coffman et al.	(Mark III Collab.)
ARMSTRONG	89	PL B221 216	T.A. Armstrong et al.	(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 et al.	(CERN, BIRM, BARI+)
RATH	89	PR D40 693	M.G. Rath et al.	(NDAM, BRAN, BNL, CUNY+)
AIHARA	88B	PL B209 107	H. Aihara et al.	(TPC-2γ Collab.)
BIRMAN	88	PRL 61 1557	A. Birman et al.	(BNL, FSU, IND, MASD) JP
BITYUKOV	88	PL B203 327	S.I. Bityukov et al.	(SERP)
MIR	88	Photon-Photon 88, 126	R. Mir	(Mark III Collab.)
Conference				
ALDE	87	PL B198 286	D.M. Alde et al.	(LANL, BRUX, SERP, LAPP)
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