$\rho(1700)$

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

A REVIEW GOES HERE – Check our WWW List of Reviews

$\rho(1700)$ MASS

$\eta\rho^0$ AND $\pi^+\pi^-$ MODES

VALUE (MeV)	DOCUMENT ID
1720±20 OUR ESTIMATE	

$\eta\rho^0$ MODE

VALUE (MeV)	DOCUMENT ID		TECN	COMMENT
The data in this block is included in the average printed for a previous datablock.				
• • • We do not use the following data for averages, fits, limits, etc. • • •				
1740±20	ANTONELLI	88	DM2	$e^+e^- \to \eta\pi^+\pi^-$
1701±15	[1] FUKUI	88	SPEC	8.95 $\pi^- p \to \eta\pi^+\pi^- n$

$\pi\pi$ MODE

VALUE (MeV)	DOCUMENT ID		TECN	COMMENT
The data in this block is included in the average printed for a previous datablock.				
• • • We do not use the following data for averages, fits, limits, etc. • • •				
1780 $^{+37}_{-29}$	[2] ABELE	97	CBAR	$\overline{p}n \to \pi^-\pi^0\pi^0$
1719 ±15	[2] BERTIN	97C	OBLX	0.0 $\overline{p}p \to \pi^+\pi^-\pi^0$
1730 ±30	CLEGG	94	RVUE	$e^+e^- \to \pi^+\pi^-$
1768 ±21	BISELLO	89	DM2	$e^+e^- \to \pi^+\pi^-$
1745.7±91.9	DUBNICKA	89	RVUE	$e^+e^- \to \pi^+\pi^-$
1546 ±26	GESHKEN...	89	RVUE	
1650	[3] ERKAL	85	RVUE	20–70 $\gamma p \to \gamma\pi$
1550 ±70	ABE	84B	HYBR	20 $\gamma p \to \pi^+\pi^- p$
1590 ±20	[4] ASTON	80	OMEG	20–70 $\gamma p \to p2\pi$
1600 ±10	[5] ATIYA	79B	SPEC	50 γ C $\to$ C2π
1598 $^{+24}_{-22}$	BECKER	79	ASPK	17 $\pi^- p$ polarized
1659 ±25	[3] LANG	79	RVUE	
1575	[3] MARTIN	78C	RVUE	17 $\pi^- p \to \pi^+\pi^- n$
1610 ±30	[3] FROGGATT	77	RVUE	17 $\pi^- p \to \pi^+\pi^- n$
1590 ±20	[6] HYAMS	73	ASPK	17 $\pi^- p \to \pi^+\pi^- n$

$\pi\omega$ MODE

VALUE (MeV)	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
1550 to 1620	[7] ACHASOV	00I	SND	$e^+e^- \to \pi^0\pi^0\gamma$
1580 to 1710	[8] ACHASOV	00I	SND	$e^+e^- \to \pi^0\pi^0\gamma$
1710±90	ACHASOV	97	RVUE	$e^+e^- \to \omega\pi^0$

$K\overline{K}$ MODE

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	CHG	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •						
1740.8±22.2	27k	[9] ABELE	99D	CBAR	±	0.0 $\overline{p}p \to K^+K^-\pi^0$
1582 ±36	1600	CLELAND	82B	SPEC	±	50 $\pi p \to K^0_S K^\pm p$

$2(\pi^+\pi^-)$ MODE

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$1851^{+\ 27}_{-\ 24}$		ACHASOV	97	RVUE	$e^+e^- \to 2(\pi^+\pi^-)$
1570± 20		[10] CORDIER	82	DM1	$e^+e^- \to 2(\pi^+\pi^-)$
1520± 30		[4] ASTON	81E	OMEG	20–70 $\gamma p \to p4\pi$
1654± 25		[11] DIBIANCA	81	DBC	$\pi^+ d \to pp2(\pi^+\pi^-)$
1666± 39		[10] BACCI	80	FRAG	$e^+e^- \to 2(\pi^+\pi^-)$
1780	34	KILLIAN	80	SPEC	11 $e^- p \to 2(\pi^+\pi^-)$
1500		[12] ATIYA	79B	SPEC	50 γC $\to$ C$4\pi^\pm$
1570± 60	65	[13] ALEXANDER	75	HBC	7.5 $\gamma p \to p4\pi$
1550± 60		[4] CONVERSI	74	OSPK	$e^+e^- \to 2(\pi^+\pi^-)$
1550± 50	160	SCHACHT	74	STRC	5.5–9 $\gamma p \to p4\pi$
1450±100	340	SCHACHT	74	STRC	9–18 $\gamma p \to p4\pi$
1430± 50	400	BINGHAM	72B	HBC	9.3 $\gamma p \to p4\pi$

$\pi^+\pi^-\pi^0\pi^0$ MODE

VALUE (MeV)	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
1660±30	ATKINSON	85B	OMEG	20–70 γp

$3(\pi^+\pi^-)$ AND $2(\pi^+\pi^-\pi^0)$ MODES

VALUE (MeV)	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
1730±34	[14] FRABETTI	04	E687	$\gamma p \to 3\pi^+3\pi^- p$
1783±15	CLEGG	90	RVUE	$e^+e^- \to 3(\pi^+\pi^-)2(\pi^+\pi^-\pi^0)$

[1] Assuming $\rho^+ f_0(1370)$ decay mode interferes with $a_1(1260)^+\pi$ background. From a two Breit-Wigner fit.

[2] T-matrix pole.

[3] From phase shift analysis of HYAMS 73 data.

[4] Simple relativistic Breit-Wigner fit with constant width.

[5] An additional 40 MeV uncertainty in both the mass and width is present due to the choice of the background shape.

[6] Included in BECKER 79 analysis.

[7] Taking into account both $\rho(1450)$ and $\rho(1700)$ contributions. Using the data of ACHASOV 00I on $e^+e^- \to \omega\pi^0$ and of EDWARDS 00A on $\tau^- \to \omega\pi^-\nu_\tau$. $\rho(1450)$ mass and width fixed at 1400 MeV and 500 MeV respectively.

[8] Taking into account the $\rho(1700)$ contribution only. Using the data of ACHASOV 00I on $e^+e^- \to \omega\pi^0$ and of EDWARDS 00A on $\tau^- \to \omega\pi^-\nu_\tau$.

[9] K-matrix pole. Isospin not determined, could be $\omega(1650)$ or $\phi(1680)$.

[10] Simple relativistic Breit-Wigner fit with model dependent width.
[11] One peak fit result.
[12] Parameters roughly estimated, not from a fit.
[13] Skew mass distribution compensated by Ross-Stodolsky factor.
[14] From a fit with two resonances with the JACOB 72 continuum.

$\rho(1700)$ WIDTH

$\eta\rho^0$ AND $\pi^+\pi^-$ MODES

VALUE (MeV)	*DOCUMENT ID*
250±100 OUR ESTIMATE	

$\eta\rho^0$ MODE

VALUE (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
The data in this block is included in the average printed for a previous datablock.				
• • • We do not use the following data for averages, fits, limits, etc. • • •				
150±30	ANTONELLI	88	DM2	$e^+e^- \to \eta\pi^+\pi^-$
282±44	[15] FUKUI	88	SPEC	8.95 $\pi^- p \to \eta\pi^+\pi^- n$

$\pi\pi$ MODE

VALUE (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
The data in this block is included in the average printed for a previous datablock.				
• • • We do not use the following data for averages, fits, limits, etc. • • •				
275 ± 45	[16] ABELE	97	CBAR	$\overline{p}n \to \pi^-\pi^0\pi^0$
310 ± 40	[16] BERTIN	97C	OBLX	0.0 $\overline{p}p \to \pi^+\pi^-\pi^0$
400 ±100	CLEGG	94	RVUE	$e^+e^- \to \pi^+\pi^-$
224 ± 22	BISELLO	89	DM2	$e^+e^- \to \pi^+\pi^-$
242.5±163.0	DUBNICKA	89	RVUE	$e^+e^- \to \pi^+\pi^-$
620 ± 60	GESHKEN...	89	RVUE	
<315	[17] ERKAL	85	RVUE	20–70 $\gamma p \to \gamma\pi$
280 $^{+\ 30}_{-\ 80}$	ABE	84B	HYBR	20 $\gamma p \to \pi^+\pi^- p$
230 ± 80	[18] ASTON	80	OMEG	20–70 $\gamma p \to p2\pi$
283 ± 14	[19] ATIYA	79B	SPEC	50 γ C $\to$ C2π
175 $^{+\ 98}_{-\ 53}$	BECKER	79	ASPK	17 $\pi^- p$ polarized
232 ± 34	[17] LANG	79	RVUE	
340	[17] MARTIN	78C	RVUE	17 $\pi^- p \to \pi^+\pi^- n$
300 ±100	[17] FROGGATT	77	RVUE	17 $\pi^- p \to \pi^+\pi^- n$
180 ± 50	[20] HYAMS	73	ASPK	17 $\pi^- p \to \pi^+\pi^- n$

$K\overline{K}$ MODE

VALUE (MeV)	*EVTS*	*DOCUMENT ID*		*TECN*	*CHG*	*COMMENT*
• • • We do not use the following data for averages, fits, limits, etc. • • •						
187.2± 26.7	27k	[21] ABELE	99D	CBAR	±	0.0 $\overline{p}p \to K^+K^-\pi^0$
265 ±120	1600	CLELAND	82B	SPEC	±	50 $\pi p \to K^0_S K^\pm p$

$2(\pi^+\pi^-)$ MODE

VALUE (MeV)	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
• • • We do not use the following data for averages, fits, limits, etc. • • •					
510± 40		[22] CORDIER	82	DM1	$e^+e^- \to 2(\pi^+\pi^-)$
400± 50		[18] ASTON	81E	OMEG	20–70 $\gamma p \to p4\pi$
400±146		[23] DIBIANCA	81	DBC	$\pi^+ d \to pp2(\pi^+\pi^-)$
700±160		[22] BACCI	80	FRAG	$e^+e^- \to 2(\pi^+\pi^-)$
100	34	KILLIAN	80	SPEC	11 $e^- p \to 2(\pi^+\pi^-)$
600		[24] ATIYA	79B	SPEC	50 γC $\to$ C$4\pi^\pm$
340±160	65	[25] ALEXANDER	75	HBC	7.5 $\gamma p \to p4\pi$
360±100		[18] CONVERSI	74	OSPK	$e^+e^- \to 2(\pi^+\pi^-)$
400±120	160	[26] SCHACHT	74	STRC	5.5–9 $\gamma p \to p4\pi$
850±200	340	[26] SCHACHT	74	STRC	9–18 $\gamma p \to p4\pi$
650±100	400	BINGHAM	72B	HBC	9.3 $\gamma p \to p4\pi$

$\pi^+\pi^-\pi^0\pi^0$ MODE

VALUE (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
• • • We do not use the following data for averages, fits, limits, etc. • • •				
300±50	ATKINSON	85B	OMEG	20–70 γp

$\omega\pi^0$ MODE

VALUE (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
• • • We do not use the following data for averages, fits, limits, etc. • • •				
350 to 580	[27] ACHASOV	00I	SND	$e^+e^- \to \pi^0\pi^0\gamma$
490 to 1040	[28] ACHASOV	00I	SND	$e^+e^- \to \pi^0\pi^0\gamma$

$3(\pi^+\pi^-)$ AND $2(\pi^+\pi^-\pi^0)$ MODES

VALUE (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
• • • We do not use the following data for averages, fits, limits, etc. • • •				
315±100	[29] FRABETTI	04	E687	$\gamma p \to 3\pi^+3\pi^- p$
285± 20	CLEGG	90	RVUE	$e^+e^- \to 3(\pi^+\pi^-)2(\pi^+\pi^-\pi^0)$

[15] Assuming $\rho^+ f_0(1370)$ decay mode interferes with $a_1(1260)^+\pi$ background. From a two Breit-Wigner fit.
[16] T-matrix pole.
[17] From phase shift analysis of HYAMS 73 data.
[18] Simple relativistic Breit-Wigner fit with constant width.
[19] An additional 40 MeV uncertainty in both the mass and width is present due to the choice of the background shape.
[20] Included in BECKER 79 analysis.
[21] K-matrix pole. Isospin not determined, could be $\omega(1650)$ or $\phi(1680)$.
[22] Simple relativistic Breit-Wigner fit with model-dependent width.
[23] One peak fit result.
[24] Parameters roughly estimated, not from a fit.
[25] Skew mass distribution compensated by Ross-Stodolsky factor.
[26] Width errors enlarged by us to $4\Gamma/\sqrt{N}$; see the note with the $K^*(892)$ mass.
[27] Taking into account both $\rho(1450)$ and $\rho(1700)$ contributions. Using the data of ACHASOV 00I on $e^+e^- \to \omega\pi^0$ and of EDWARDS 00A on $\tau^- \to \omega\pi^-\nu_\tau$. $\rho(1450)$ mass and width fixed at 1400 MeV and 500 MeV respectively.
[28] Taking into account the $\rho(1700)$ contribution only. Using the data of ACHASOV 00I on $e^+e^- \to \omega\pi^0$ and of EDWARDS 00A on $\tau^- \to \omega\pi^-\nu_\tau$.
[29] From a fit with two resonances with the JACOB 72 continuum.

$\rho(1700)$ DECAY MODES

	Mode	Fraction (Γ_i/Γ)
Γ_1	4π	
Γ_2	$2(\pi^+\pi^-)$	large
Γ_3	$\rho\pi\pi$	dominant
Γ_4	$\rho^0\pi^+\pi^-$	large
Γ_5	$\rho^0\pi^0\pi^0$	
Γ_6	$\rho^\pm\pi^\mp\pi^0$	large
Γ_7	$a_1(1260)\pi$	seen
Γ_8	$h_1(1170)\pi$	seen
Γ_9	$\pi(1300)\pi$	seen
Γ_{10}	$\rho\rho$	seen
Γ_{11}	$\pi^+\pi^-$	seen
Γ_{12}	$\pi\pi$	seen
Γ_{13}	$K\overline{K}^*(892)+$ c.c.	seen
Γ_{14}	$\eta\rho$	seen
Γ_{15}	$a_2(1320)\pi$	not seen
Γ_{16}	$K\overline{K}$	seen
Γ_{17}	e^+e^-	seen
Γ_{18}	$\pi^0\omega$	seen

$\rho(1700)$ $\Gamma(i)\Gamma(e^+e^-)/\Gamma(\text{total})$

This combination of a partial width with the partial width into e^+e^- and with the total width is obtained from the cross-section into channel$_i$ in e^+e^- annihilation.

$\Gamma(2(\pi^+\pi^-)) \times \Gamma(e^+e^-)/\Gamma_{\text{total}}$ $\quad \Gamma_2\Gamma_{17}/\Gamma$

VALUE (keV)	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
2.6 $\pm$0.2	DELCOURT	81B	DM1	$e^+e^- \to 2(\pi^+\pi^-)$
2.83$\pm$0.42	BACCI	80	FRAG	$e^+e^- \to 2(\pi^+\pi^-)$

$\Gamma(\pi^+\pi^-) \times \Gamma(e^+e^-)/\Gamma_{\text{total}}$ $\quad \Gamma_{11}\Gamma_{17}/\Gamma$

VALUE (keV)	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.13	[30] DIEKMAN	88	RVUE	$e^+e^- \to \pi^+\pi^-$
$0.029^{+0.016}_{-0.012}$	KURDADZE	83	OLYA	0.64–1.4 $e^+e^- \to \pi^+\pi^-$

$\Gamma(K\overline{K}^*(892)+\text{c.c.}) \times \Gamma(e^+e^-)/\Gamma_{\text{total}}$ $\quad \Gamma_{13}\Gamma_{17}/\Gamma$

VALUE (keV)	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.305$\pm$0.071	[31] BIZOT	80	DM1	e^+e^-

$\Gamma(\eta\rho) \times \Gamma(e^+e^-)/\Gamma_{total}$ $\Gamma_{14}\Gamma_{17}/\Gamma$

VALUE (eV)	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
7 ± 3	ANTONELLI	88	DM2	$e^+e^- \to \eta\pi^+\pi^-$

$\Gamma(K\overline{K}) \times \Gamma(e^+e^-)/\Gamma_{total}$ $\Gamma_{16}\Gamma_{17}/\Gamma$

VALUE (keV)	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.035 ± 0.029	[31] BIZOT	80	DM1	e^+e^-

$\Gamma(\rho\pi\pi) \times \Gamma(e^+e^-)/\Gamma_{total}$ $\Gamma_3\Gamma_{17}/\Gamma$

VALUE (keV)	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
3.510 ± 0.090	[31] BIZOT	80	DM1	e^+e^-

[30] Using total width = 220 MeV.
[31] Model dependent.

$\rho(1700)$ BRANCHING RATIOS

$\Gamma(\rho\pi\pi)/\Gamma(4\pi)$ Γ_3/Γ_1

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.28 ± 0.06	[32] ABELE	01B	CBAR	$0.0\ \overline{p}n \to 5\pi$

$\Gamma(\rho^0\pi^+\pi^-)/\Gamma(2(\pi^+\pi^-))$ Γ_4/Γ_2

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
~ 1.0		DELCOURT	81B	DM1	$e^+e^- \to 2(\pi^+\pi^-)$
$0.7\ \pm0.1$	500	SCHACHT	74	STRC	5.5–18 $\gamma p \to p4\pi$
0.80		[33] BINGHAM	72B	HBC	9.3 $\gamma p \to p4\pi$

$\Gamma(\rho^0\pi^0\pi^0)/\Gamma(\rho^\pm\pi^\mp\pi^0)$ Γ_5/Γ_6

VALUE	DOCUMENT ID		TECN	CHG	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.10	ATKINSON	85B	OMEG		20–70 γp
<0.15	ATKINSON	82	OMEG	0	20–70 $\gamma p \to p4\pi$

$\Gamma(a_1(1260)\pi)/\Gamma(4\pi)$ Γ_7/Γ_1

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.16 ± 0.05	[32] ABELE	01B	CBAR	$0.0\ \overline{p}n \to 5\pi$

$\Gamma(h_1(1170)\pi)/\Gamma(4\pi)$ Γ_8/Γ_1

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.17 ± 0.06	[32] ABELE	01B	CBAR	$0.0\ \overline{p}n \to 5\pi$

$\Gamma(\pi(1300)\pi)/\Gamma(4\pi)$ Γ_9/Γ_1

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.30 ± 0.10	[32] ABELE	01B	CBAR	$0.0\ \overline{p}n \rightarrow\ 5\pi$

$\Gamma(\rho\rho)/\Gamma(4\pi)$ Γ_{10}/Γ_1

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.09 ± 0.03	[32] ABELE	01B	CBAR	$0.0\ \overline{p}n \rightarrow\ 5\pi$

$\Gamma(\pi^+\pi^-)/\Gamma_{\text{total}}$ Γ_{11}/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$0.287^{+0.043}_{-0.042}$	BECKER	79	ASPK	17 $\pi^- p$ polarized
0.15 to 0.30	[34] MARTIN	78C	RVUE	$17\ \pi^- p \rightarrow\ \pi^+\pi^- n$
<0.20	[35] COSTA...	77B	RVUE	$e^+e^- \rightarrow\ 2\pi,\ 4\pi$
$0.30\ \pm0.05$	[34] FROGGATT	77	RVUE	$17\ \pi^- p \rightarrow\ \pi^+\pi^- n$
<0.15	[36] EISENBERG	73	HBC	$5\ \pi^+ p \rightarrow\ \Delta^{++}2\pi$
$0.25\ \pm0.05$	[37] HYAMS	73	ASPK	$17\ \pi^- p \rightarrow\ \pi^+\pi^- n$

$\Gamma(\pi^+\pi^-)/\Gamma(2(\pi^+\pi^-))$ Γ_{11}/Γ_2

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.13 ± 0.05	ASTON	80	OMEG	$20\text{–}70\ \gamma p \rightarrow\ p2\pi$
<0.14	[38] DAVIER	73	STRC	$6\text{–}18\ \gamma p \rightarrow\ p4\pi$
<0.2	[39] BINGHAM	72B	HBC	$9.3\ \gamma p \rightarrow\ p2\pi$

$\Gamma(\pi\pi)/\Gamma(4\pi)$ Γ_{12}/Γ_1

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.16 ± 0.04	[32,40] ABELE	01B	CBAR	$0.0\ \overline{p}n \rightarrow\ 5\pi$

$\Gamma(K\overline{K}^*(892)+\text{c.c.})/\Gamma_{\text{total}}$ Γ_{13}/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
possibly seen	COAN	04	CLEO	$\tau^- \rightarrow\ K^-\pi^- K^+\nu_\tau$

$\Gamma(K\overline{K}^*(892)+\text{c.c.})/\Gamma(2(\pi^+\pi^-))$ Γ_{13}/Γ_2

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.15 ± 0.03	[41] DELCOURT	81B	DM1	$e^+e^- \rightarrow\ \overline{K}K\pi$

$\Gamma(\eta\rho)/\Gamma_{\text{total}}$ Γ_{14}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
possibly seen		AKHMETSHIN	00D	CMD2	$e^+e^- \rightarrow\ \eta\pi^+\pi^-$
<0.04		DONNACHIE	87B	RVUE	
<0.02	58	ATKINSON	86B	OMEG	$20\text{–}70\ \gamma p$

$\Gamma(\eta\rho)/\Gamma(2(\pi^+\pi^-))$ Γ_{14}/Γ_2

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.123 ± 0.027	DELCOURT	82	DM1	$e^+e^-\to\pi^+\pi^-$ MM
~ 0.1	ASTON	80	OMEG	20–70 γp

$\Gamma(\pi^+\pi^-\text{neutrals})/\Gamma(2(\pi^+\pi^-))$ $(\Gamma_5+\Gamma_6+0.714\Gamma_{14})/\Gamma_2$

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
2.6 ± 0.4	[42] BALLAM	74	HBC	9.3 γp

$\Gamma(a_2(1320)\pi)/\Gamma_{\text{total}}$ Γ_{15}/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
not seen	AMELIN	00	VES	37 $\pi^- p\to\eta\pi^+\pi^- n$

$\Gamma(K\overline{K})/\Gamma(2(\pi^+\pi^-))$ Γ_{16}/Γ_2

VALUE	CL%	DOCUMENT ID		TECN	CHG	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •						
0.015 ± 0.010		[43] DELCOURT	81B	DM1		$e^+e^-\to\overline{K}K$
<0.04	95	BINGHAM	72B	HBC	0	9.3 γp

$\Gamma(K\overline{K})/\Gamma(K\overline{K}^*(892)+\text{c.c.})$ Γ_{16}/Γ_{13}

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.052 ± 0.026	BUON	82	DM1	$e^+e^-\to$ hadrons

$\Gamma(\pi^0\omega)/\Gamma_{\text{total}}$ Γ_{18}/Γ

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
not seen	2382	AKHMETSHIN	03B	CMD2	$e^+e\to\pi^0\pi^0\gamma$
seen		ACHASOV	97	RVUE	$e^+e^-\to\omega\pi^0$

[32] $\omega\pi$ not included.
[33] The $\pi\pi$ system is in S-wave.
[34] From phase shift analysis of HYAMS 73 data.
[35] Estimate using unitarity, time reversal invariance, Breit-Wigner.
[36] Estimated using one-pion-exchange model.
[37] Included in BECKER 79 analysis.
[38] Upper limit is estimate.
[39] 2σ upper limit.
[40] Using ABELE 97.
[41] Assuming $\rho(1700)$ and ω radial excitations to be degenerate in mass.
[42] Upper limit. Background not subtracted.
[43] Assuming $\rho(1700)$ and ω radial excitations to be degenerate in mass.

ρ(1700) REFERENCES

COAN	04	PRL 92 232001	T.E. Coan *et al.*	(CLEO Collab.)
FRABETTI	04	PL B578 290	P.L. Frabetti *et al.*	(FNAL E687 Collab.)
AKHMETSHIN	03B	PL B562 173	R.R. Akhmetshin *et al.*	(Novosibirsk CMD-2 Collab.)
ABELE	01B	EPJ C21 261	A. Abele *et al.*	(Crystal Barrel Collab.)
ACHASOV	00I	PL B486 29	M.N. Achasov *et al.*	(Novosibirsk SND Collab.)
AKHMETSHIN	00D	PL B489 125	R.R. Akhmetshin *et al.*	(Novosibirsk CMD-2 Collab.)
AMELIN	00	NP A668 83	D. Amelin *et al.*	(VES Collab.)
EDWARDS	00A	PR D61 072003	K.W. Edwards *et al.*	(CLEO Collab.)
ABELE	99D	PL B468 178	A. Abele *et al.*	(Crystal Barrel Collab.)
ABELE	97	PL B391 191	A. Abele *et al.*	(Crystal Barrel Collab.)
ACHASOV	97	PR D55 2663	N.N. Achasov *et al.*	(NOVM)
BERTIN	97C	PL B408 476	A. Bertin *et al.*	(OBELIX Collab.)
CLEGG	94	ZPHY C62 455	A.B. Clegg, A. Donnachie	(LANC, MCHS)
CLEGG	90	ZPHY C45 677	A.B. Clegg, A. Donnachie	(LANC, MCHS)
BISELLO	89	PL B220 321	D. Bisello *et al.*	(DM2 Collab.)
DUBNICKA	89	JPG 15 1349	S. Dubnicka *et al.*	(JINR, SLOV)
GESHKEN...	89	ZPHY C45 351	B.V. Geshkenbein	(ITEP)
ANTONELLI	88	PL B212 133	A. Antonelli *et al.*	(DM2 Collab.)
DIEKMAN	88	PRPL 159 99	B. Diekmann	(BONN)
FUKUI	88	PL B202 441	S. Fukui *et al.*	(SUGI, NAGO, KEK, KYOT+)
DONNACHIE	87B	ZPHY C34 257	A. Donnachie, A.B. Clegg	(MCHS, LANC)
ATKINSON	86B	ZPHY C30 531	M. Atkinson *et al.*	(BONN, CERN, GLAS+)
ATKINSON	85B	ZPHY C26 499	M. Atkinson *et al.*	(BONN, CERN, GLAS+)
ERKAL	85	ZPHY C29 485	C. Erkal, M.G. Olsson	(WISC)
ABE	84B	PRL 53 751	K. Abe *et al.*	
KURDADZE	83	JETPL 37 733	L.M. Kurdadze *et al.*	(NOVO)
		Translated from ZETFP 37 613.		
ATKINSON	82	PL 108B 55	M. Atkinson *et al.*	(BONN, CERN, GLAS+)
BUON	82	PL 118B 221	J. Buon *et al.*	(LALO, MONP)
CLELAND	82B	NP B208 228	W.E. Cleland *et al.*	(DURH, GEVA, LAUS+)
CORDIER	82	PL 109B 129	A. Cordier *et al.*	(LALO)
DELCOURT	82	PL 113B 93	B. Delcourt *et al.*	(LALO)
ASTON	81E	NP B189 15	D. Aston	(BONN, CERN, EPOL, GLAS, LANC+)
DELCOURT	81B	Bonn Conf. 205	B. Delcourt	(ORSAY)
Also		PL 109B 129	A. Cordier *et al.*	(LALO)
DIBIANCA	81	PR D23 595	F.A. di Bianca *et al.*	(CASE, CMU)
ASTON	80	PL 92B 215	D. Aston	(BONN, CERN, EPOL, GLAS, LANC+)
BACCI	80	PL 95B 139	C. Bacci *et al.*	(ROMA, FRAS)
BIZOT	80	Madison Conf. 546	J.C. Bizot *et al.*	(LALO, MONP)
KILLIAN	80	PR D21 3005	T.J. Killian *et al.*	(CORN)
ATIYA	79B	PRL 43 1691	M.S. Atiya *et al.*	(COLU, ILL, FNAL)
BECKER	79	NP B151 46	H. Becker *et al.*	(MPIM, CERN, ZEEM, CRAC)
LANG	79	PR D19 956	C.B. Lang, A. Mas-Parareda	(GRAZ)
MARTIN	78C	ANP 114 1	A.D. Martin, M.R. Pennington	(CERN)
COSTA...	77B	PL 71B 345	B. Costa de Beauregard, B. Pire, T.N. Truong	(EPOL)
FROGGATT	77	NP B129 89	C.D. Froggatt, J.L. Petersen	(GLAS, NORD)
ALEXANDER	75	PL 57B 487	G. Alexander *et al.*	(TELA)
BALLAM	74	NP B76 375	J. Ballam *et al.*	(SLAC, LBL, MPIM)
CONVERSI	74	PL 52B 493	M. Conversi *et al.*	(ROMA, FRAS)
SCHACHT	74	NP B81 205	P. Schacht *et al.*	(MPIM)
DAVIER	73	NP B58 31	M. Davier *et al.*	(SLAC)
EISENBERG	73	PL 43B 149	Y. Eisenberg *et al.*	(REHO)
HYAMS	73	NP B64 134	B.D. Hyams *et al.*	(CERN, MPIM)
BINGHAM	72B	PL 41B 635	H.H. Bingham *et al.*	(LBL, UCB, SLAC) IGJP
JACOB	72	PR D5 1847	M. Jacob, R. Slansky	

OTHER RELATED PAPERS

AUBERT	08S	PR D77 092002	B. Aubert *et al.*	(BABAR Collab.)
ACHASOV	07A	PR D76 072012	M.N. Achasov *et al.*	(SND Collab.)
LI	07A	PR D76 094016	B.A. Li	
LIU	07B	PR D75 074017	X. Liu *et al.*	
ABLIKIM	06S	PRL 97 142002	M. Ablikim *et al.*	(BES Collab.)
ACHASOV	06D	JETP 103 720	N.N. Achasov *et al.*	(SND Collab.)
		Translated from ZETF 130 831.		

AUBERT	06D	PR D73 052003	B. Aubert *et al.*	(BABAR Collab.)
DAVIER	06	RMP 78 1043	M. Davier, A. Hocker, Z. Zhang	(LALO, PARIN+)
ABE	05H	hep-ex/0512071	K. Abe *et al.*	(BELLE Collab.)
ACHASOV	05A	JETP 101 1053	M.N. Achasov *et al.*	(Novosibirsk SND Collab.)
		Translated from ZETF 128 1201.		
AUBERT	05D	PR D71 052001	B. Aubert *et al.*	(BABAR Collab.)
AULCHENKO	05	JETPL 82 743	V.M. Aulchenko *et al.*	(Novosibirsk CMD-2 Collab.)
		Translated from ZETFP 82 841.		
SCHAEL	05C	PRPL 421 191	S. Schael *et al.*	(ALEPH Collab.)
AKHMETSHIN	04C	PL B595 101	R.R. Akhmetshin *et al.*	(Novosibirsk CMD-2 Collab.)
AMSLER	04A	NP A740 130	C. Amsler *et al.*	
ACHASOV	03C	JETP 96 789	M.N. Achasov *et al.*	(Novosibirsk SND Collab.)
		Translated from ZETF 123 899.		
AKHMETSHIN	03	PL B551 27	R.R. Akhmetshin *et al.*	(Novosibirsk CMD-2 Collab.)
Also		PAN 65 1222	E.V. Anashkin, V.M. Aulchenko, R.R. Akhmetshin	
		Translated from YAF 65 1255.		
BARGIOTTI	03B	PL B561 233	M. Bargiotti *et al.*	
ACHASOV	02B	PAN 65 153	N.N. Achasov, A.A. Kozhevnikov	
		Translated from YAF 65 158.		
AGNELLO	02	PL B527 39	M. Agnello *et al.*	(OBELIX Collab.)
CLOSE	02	PR D65 092003	F.E. Close, A. Donnachie, Yu.S. Kalashnikova	
ALEXANDER	01B	PR D64 092001	J.P. Alexander *et al.*	(CLEO Collab.)
FRABETTI	01	PL B514 240	P.L. Frabetti *et al.*	(FNAL E687 Collab.)
ACHASOV	00J	PR D62 117503	N.N. Achasov, A.A. Kozhevnikov	
ANDERSON	00A	PR D61 112002	S. Anderson *et al.*	(CLEO Collab.)
ABELE	99C	PL B450 275	A. Abele *et al.*	(Crystal Barrel Collab.)
AKHMETSHIN	99E	PL B466 392	R.R. Akhmetshin *et al.*	(Novosibirsk CMD-2 Collab.)
DONNACHIE	99	PR D60 114011	A. Donnachie, Yu.S. Kalashnikova	
KULZINGER	99	EPJ C7 73	G. Kulzinger *et al.*	
ABELE	98	PR D57 3860	A. Abele *et al.*	(Crystal Barrel Collab.)
ANTONELLI	98	NP B517 3	A. Antonelli *et al.*	(FENICE Collab.)
BELOZEROVA	98	PPN 29 63	T.S. Belozerova, V.K. Henner	
		Translated from FECAY 29 148.		
BERTIN	98B	PL B434 180	A. Bertin *et al.*	(OBELIX Collab.)
BARATE	97M	ZPHY C76 15	R. Barate *et al.*	(ALEPH Collab.)
BARNES	97	PR D55 4157	T. Barnes *et al.*	(ORNL, RAL, MCHS)
CLOSE	97C	PR D56 1584	F.E. Close *et al.*	(RAL, MCHS)
URHEIM	97	NPBPS 55C 359	J. Urheim	(CLEO Collab.)
ACHASOV	96B	PAN 59 1262	N.N. Achasov, G.N. Shestakov	(NOVM)
		Translated from YAF 59 1319.		
ANTONELLI	96	PL B365 427	A. Antonelli *et al.*	(FENICE Collab.)
AMSLER	93B	PL B311 362	C. Amsler *et al.*	(Crystal Barrel Collab.)
LANDSBERG	92	SJNP 55 1051	L.G. Landsberg	(SERP)
		Translated from YAF 55 1896.		
ASTON	91B	NPBPS 21 105	D. Aston *et al.*	(LASS Collab.)
BISELLO	91C	ZPHY C52 227	D. Bisello *et al.*	(DM2 Collab.)
DOLINSKY	91	PRPL 202 99	S.I. Dolinsky *et al.*	(NOVO)
DONNACHIE	91	ZPHY C51 689	A. Donnachie, A.B. Clegg	(MCHS, LANC)
ACHASOV	88C	PL B209 373	N.N. Achasov, A.A. Kozhevnikov	(NOVM)
BRAU	88	PR D37 2379	J.E. Brau *et al.*	JP
CASTRO	88	Preprint LAL-88-58	A. Castro *et al.*	(DM2 Collab.)
CLEGG	88	ZPHY C40 313	A.B. Clegg, A. Donnachie	(MCHS, LANC)
BITYUKOV	87	PL B188 383	S.I. Bityukov *et al.*	(SERP)
DONNACHIE	87	ZPHY C33 407	A. Donnachie, H. Mirzaie	(MCHS)
ERKAL	86	ZPHY C31 615	C. Erkal, M.G. Olsson	(WISC)
ATKINSON	85	ZPHY C29 333	M. Atkinson *et al.*	(BONN, CERN, GLAS+)
BARKOV	85	NP B256 365	L.M. Barkov *et al.*	(NOVO)
ATKINSON	84C	NP B243 1	M. Atkinson *et al.*	(BONN, CERN, GLAS+) JP
ATKINSON	83B	PL 127B 132	M. Atkinson *et al.*	(BONN, CERN, GLAS+)
ATKINSON	83C	NP B229 269	M. Atkinson *et al.*	(BONN, CERN, GLAS+)
AUGUSTIN	83	LAL 83-21	J.E. Augustin *et al.*	(LALO, PADO, FRAS)
SHAMBROOM	82	PR D26 1	W.D. Shambroom *et al.*	(HARV, EFI, ILL+)
BISELLO	81	PL 107B 145	D. Bisello *et al.*	(DM1 Collab.)
ASTON	80C	PL 92B 211	D. Aston	(BONN, CERN, EPOL, GLAS, LANC+)
BARBER	80C	ZPHY C4 169	D.P. Barber *et al.*	(DARE, LANC, SHEF)
KILLIAN	80	PR D21 3005	T.J. Killian *et al.*	(CORN)
COSME	76	PL 63B 352	G. Cosme *et al.*	(ORSAY)
FRENKIEL	72	NP B47 61	P. Frenkiel *et al.*	(CDEF, CERN)
ALVENSLEB...	71	PRL 26 273	H. Alvensleben *et al.*	(DESY, MIT) G
BRAUN	71	NP B30 213	H.M. Braun *et al.*	(STRB) G
BULOS	71	PRL 26 149	F. Bulos *et al.*	(SLAC, UMD, IBM, LBL) G
LAYSSAC	71	NC 6A 134	J. Layssac, F.M. Renard	(MONP)