

$\rho_3(1690)$

$$I^G(J^{PC}) = 1^+(3^{- -})$$

$\rho_3(1690)$ MASS

VALUE (MeV)

DOCUMENT ID

1691 \pm 5 OUR ESTIMATE This is only an educated guess; the error given is larger than the error on the average of the published values.

1688.8 \pm 2.1 OUR AVERAGE Includes data from the 5 datablocks that follow this one.

2 π MODE

VALUE (MeV) EVTS DOCUMENT ID TECN CHG COMMENT

The data in this block is included in the average printed for a previous datablock.

1686 \pm 4 OUR AVERAGE

1677 \pm 14		EVANGELISTA 81	OMEG	-	12 $\pi^- p \rightarrow 2\pi p$
1679 \pm 11	476	BALTAY	78B	HBC	0 15 $\pi^+ p \rightarrow$ $\pi^+ \pi^- n$
1678 \pm 12	175	¹ ANTIPOV	77	CIBS	0 25 $\pi^- p \rightarrow p3\pi$
1690 \pm 7	600	¹ ENGLER	74	DBC	0 6 $\pi^+ n \rightarrow$ $\pi^+ \pi^- p$
1693 \pm 8		² GRAYER	74	ASPK	0 17 $\pi^- p \rightarrow$ $\pi^+ \pi^- n$
1678 \pm 12		MATTHEWS 71C	DBC	0	7 $\pi^+ N$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●					
1734 \pm 10		³ CORDEN	79	OMEG	12-15 $\pi^- p \rightarrow$ $n2\pi$
1692 \pm 12		^{2,4} ESTABROOKS 75	RVUE		17 $\pi^- p \rightarrow$ $\pi^+ \pi^- n$
1737 \pm 23		ARMENISE 70	DBC	0	9 $\pi^+ N$
1650 \pm 35	122	BARTSCH 70B	HBC	+	8 $\pi^+ p \rightarrow N2\pi$
1687 \pm 21		STUNTEBECK 70	HDBC	0	8 $\pi^- p, 5.4 \pi^+ d$
1683 \pm 13		ARMENISE 68	DBC	0	5.1 $\pi^+ d$
1670 \pm 30		GOLDBERG 65	HBC	0	6 $\pi^+ d, 8 \pi^- p$

¹ Mass errors enlarged by us to Γ/\sqrt{N} ; see the note with the $K^*(892)$ mass.

² Uses same data as HYAMS 75.

³ From a phase shift solution containing a $f_2'(1525)$ width two times larger than the $K\bar{K}$ result.

⁴ From phase-shift analysis. Error takes account of spread of different phase-shift solutions.

$K\bar{K}$ AND $K\bar{K}\pi$ MODES

VALUE (MeV) EVTS DOCUMENT ID TECN CHG COMMENT

The data in this block is included in the average printed for a previous datablock.

1696 \pm 4 OUR AVERAGE

1699 \pm 5		ALPER	80	CNTR	0 62 $\pi^- p \rightarrow$ $K^+ K^- n$
1698 \pm 12	6k	^{5,6} MARTIN	78D	SPEC	10 $\pi p \rightarrow$ $K_S^0 K^- p$
1692 \pm 6		BLUM	75	ASPK	0 18.4 $\pi^- p \rightarrow$ $nK^+ K^-$
1690 \pm 16		ADERHOLZ 69	HBC	+	8 $\pi^+ p \rightarrow K\bar{K}\pi$

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

1694 ± 8 ⁷ COSTA... 80 OMEG 10 $\pi^- p \rightarrow K^+ K^- n$

⁵ From a fit to $J^P = 3^-$ partial wave.

⁶ Systematic error on mass scale subtracted.

⁷ They cannot distinguish between $\rho_3(1690)$ and $\omega_3(1670)$.

(4π)[±] MODE

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	CHG	COMMENT
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The data in this block is included in the average printed for a previous datablock.

1686 ± 5 OUR AVERAGE Error includes scale factor of 1.1.

1694 ± 6		⁸ EVANGELISTA 81	OMEG -		12 $\pi^- p \rightarrow p4\pi$
1665 ± 15	177	BALTAY 78B	HBC +		15 $\pi^+ p \rightarrow p4\pi$
1670 ± 10		THOMPSON 74	HBC +		13 $\pi^+ p$
1687 ± 20		CASON 73	HBC -		8, 18.5 $\pi^- p$
1685 ± 14		⁹ CASON 73	HBC -		8, 18.5 $\pi^- p$
1680 ± 40	144	BARTSCH 70B	HBC +		8 $\pi^+ p \rightarrow N4\pi$
1689 ± 20	102	⁹ BARTSCH 70B	HBC +		8 $\pi^+ p \rightarrow N2\rho$
1705 ± 21		CASO 70	HBC -		11.2 $\pi^- p \rightarrow n\rho2\pi$

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

1718 ± 10		¹⁰ EVANGELISTA 81	OMEG -		12 $\pi^- p \rightarrow p4\pi$
1673 ± 9		¹¹ EVANGELISTA 81	OMEG -		12 $\pi^- p \rightarrow p4\pi$
1733 ± 9	66	⁹ KLIGER 74	HBC -		4.5 $\pi^- p \rightarrow p4\pi$
1630 ± 15		HOLMES 72	HBC +		10-12 $K^+ p$
1720 ± 15		BALTAY 68	HBC +		7, 8.5 $\pi^+ p$

⁸ From $\rho^- \rho^0$ mode, not independent of the other two EVANGELISTA 81 entries.

⁹ From $\rho^\pm \rho^0$ mode.

¹⁰ From $a_2(1320)^- \pi^0$ mode, not independent of the other two EVANGELISTA 81 entries.

¹¹ From $a_2(1320)^0 \pi^-$ mode, not independent of the other two EVANGELISTA 81 entries.

$\omega\pi$ MODE

VALUE (MeV)	DOCUMENT ID	TECN	CHG	COMMENT
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The data in this block is included in the average printed for a previous datablock.

1681 ± 7 OUR AVERAGE

1670 ± 25		¹² ALDE 95	GAM2		38 $\pi^- p \rightarrow \omega\pi^0 n$
1690 ± 15		EVANGELISTA 81	OMEG -		12 $\pi^- p \rightarrow \omega\pi p$
1666 ± 14		GESSAROLI 77	HBC		11 $\pi^- p \rightarrow \omega\pi p$
1686 ± 9		THOMPSON 74	HBC +		13 $\pi^+ p$

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

1654 ± 24		BARNHAM 70	HBC +		10 $K^+ p \rightarrow \omega\pi X$
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¹² Supersedes ALDE 92C.

$\eta\pi^+\pi^-$ MODE

(For difficulties with MMS experiments, see the $a_2(1320)$ mini-review in the 1973 edition.)

<u>VALUE (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>CHG</u>	<u>COMMENT</u>
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The data in this block is included in the average printed for a previous datablock.

1682±12 OUR AVERAGE

1685±10±20	AMELIN	00	VES	37 $\pi^- p \rightarrow \eta\pi^+\pi^- n$
1680±15	FUKUI	88	SPEC 0	8.95 $\pi^- p \rightarrow \eta\pi^+\pi^- n$

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

1700±47	¹³ ANDERSON	69	MMS	–	16 $\pi^- p$ backward
1632±15	^{13,14} FOCACCI	66	MMS	–	7–12 $\pi^- p \rightarrow \rho MM$
1700±15	^{13,14} FOCACCI	66	MMS	–	7–12 $\pi^- p \rightarrow \rho MM$
1748±15	^{13,14} FOCACCI	66	MMS	–	7–12 $\pi^- p \rightarrow \rho MM$

¹³ Seen in 2.5–3 GeV/c $\bar{p}p$. $2\pi^+2\pi^-$, with 0, 1, 2 $\pi^+\pi^-$ pairs in ρ band not seen by OREN 74 (2.3 GeV/c $\bar{p}p$) with more statistics. (Jan. 1976)

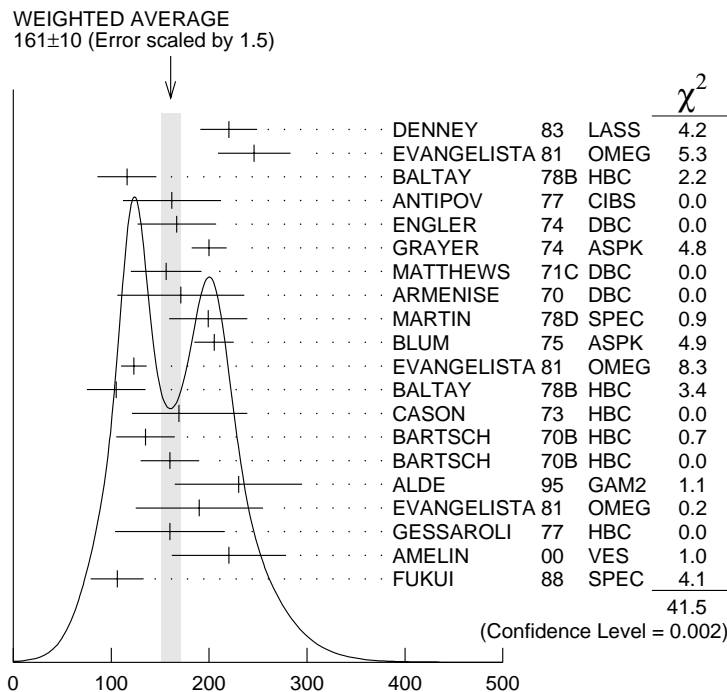
¹⁴ Not seen by BOWEN 72.

$\rho_3(1690)$ WIDTH

$2\pi, K\bar{K},$ AND $K\bar{K}\pi$ MODES

VALUE (MeV) _____ DOCUMENT ID _____

161 ± 10 OUR AVERAGE Includes data from the 5 datablocks that follow this one. Error includes scale factor of 1.5. See the ideogram below.



$\rho_3(1690)$ width, $2\pi, K\bar{K},$ and $K\bar{K}\pi$ modes (MeV)

2π MODE

VALUE (MeV) _____ EVTS _____ DOCUMENT ID _____ TECN _____ CHG _____ COMMENT _____

The data in this block is included in the average printed for a previous datablock.

186 ± 14 OUR AVERAGE Error includes scale factor of 1.3. See the ideogram below.

220 ± 29		DENNEY	83	LASS		10 $\pi^+ N$
246 ± 37		EVANGELISTA	81	OMEG	—	12 $\pi^- p \rightarrow 2\pi p$
116 ± 30	476	BALTAY	78B	HBC	0	15 $\pi^+ p \rightarrow$ $\pi^+ \pi^- n$
162 ± 50	175	15 ANTIPOV	77	CIBS	0	25 $\pi^- p \rightarrow p3\pi$
167 ± 40	600	ENGLER	74	DBC	0	6 $\pi^+ n \rightarrow$ $\pi^+ \pi^- p$
200 ± 18		16 GRAYER	74	ASPK	0	17 $\pi^- p \rightarrow$ $\pi^+ \pi^- n$
156 ± 36		MATTHEWS	71C	DBC	0	7 $\pi^+ N$
171 ± 65		ARMENISE	70	DBC	0	9 $\pi^+ d$

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

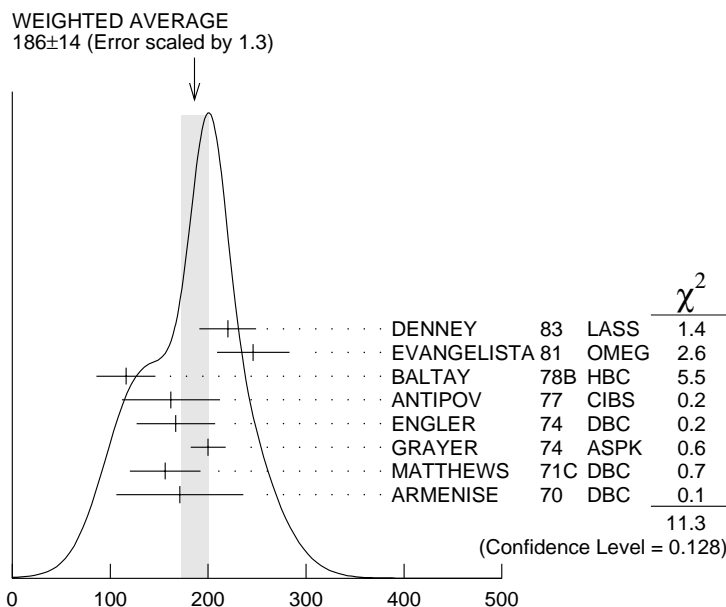
322 ± 35	17	CORDEN	79	OMEG	12-15	$\pi^- p \rightarrow n2\pi$
240 ± 30	16,18	ESTABROOKS	75	RVUE	17	$\pi^- p \rightarrow \pi^+ \pi^- n$
180 ± 30	122	BARTSCH	70B	HBC	+	8 $\pi^+ p \rightarrow N2\pi$
267 ⁺⁷² ₋₄₆		STUNTEBECK	70	HDBC	0	8 $\pi^- p$, 5.4 $\pi^+ d$
188 ± 49		ARMENISE	68	DBC	0	5.1 $\pi^+ d$
180 ± 40		GOLDBERG	65	HBC	0	6 $\pi^+ d$, 8 $\pi^- p$

¹⁵ Width errors enlarged by us to $4\Gamma/\sqrt{N}$; see the note with the $K^*(892)$ mass.

¹⁶ Uses same data as HYAMS 75 and BECKER 79.

¹⁷ From a phase shift solution containing a $f_2'(1525)$ width two times larger than the $K\bar{K}$ result.

¹⁸ From phase-shift analysis. Error takes account of spread of different phase-shift solutions.



$\rho_3(1690)$ width, 2π mode (MeV)

$K\bar{K}$ AND $K\bar{K}\pi$ MODES

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	CHG	COMMENT
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The data in this block is included in the average printed for a previous datablock.

204 ± 18 OUR AVERAGE

199 ± 40	6000	¹⁹ MARTIN	78D	SPEC	10 $\pi p \rightarrow K_S^0 K^- p$
205 ± 20		BLUM	75	ASPK 0	18.4 $\pi^- p \rightarrow nK^+ K^-$

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

219 ± 4		ALPER	80	CNTR	0	62	$\pi^- p \rightarrow$
							$K^+ K^- n$
186 ± 11		²⁰ COSTA...	80	OMEG		10	$\pi^- p \rightarrow$
							$K^+ K^- n$
112 ± 60		ADERHOLZ	69	HBC	+	8	$\pi^+ p \rightarrow K \bar{K} \pi$

¹⁹ From a fit to $J^P = 3^-$ partial wave.

²⁰ They cannot distinguish between $\rho_3(1690)$ and $\omega_3(1670)$.

$(4\pi)^\pm$ MODE

<u>VALUE (MeV)</u>	<u>EVTs</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>CHG</u>	<u>COMMENT</u>
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The data in this block is included in the average printed for a previous datablock.

129 ± 10 OUR AVERAGE

123 ± 13		²¹ EVANGELISTA	81	OMEG	-	12	$\pi^- p \rightarrow p 4\pi$
105 ± 30	177	BALTAY	78B	HBC	+	15	$\pi^+ p \rightarrow p 4\pi$
169 ⁺⁷⁰ -48		CASON	73	HBC	-	8,18.5	$\pi^- p$
135 ± 30	144	BARTSCH	70B	HBC	+	8	$\pi^+ p \rightarrow N 4\pi$
160 ± 30	102	BARTSCH	70B	HBC	+	8	$\pi^+ p \rightarrow N 2\rho$

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

230 ± 28		²² EVANGELISTA	81	OMEG	-	12	$\pi^- p \rightarrow p 4\pi$
184 ± 33		²³ EVANGELISTA	81	OMEG	-	12	$\pi^- p \rightarrow p 4\pi$
150	66	²⁴ KLIGER	74	HBC	-	4.5	$\pi^- p \rightarrow p 4\pi$
106 ± 25		THOMPSON	74	HBC	+	13	$\pi^+ p$
125 ⁺⁸³ -35		²⁴ CASON	73	HBC	-	8,18.5	$\pi^- p$
130 ± 30		HOLMES	72	HBC	+	10-12	$K^+ p$
180 ± 30	90	²⁴ BARTSCH	70B	HBC	+	8	$\pi^+ p \rightarrow N a_2 \pi$
100 ± 35		BALTAY	68	HBC	+	7, 8.5	$\pi^+ p$

²¹ From $\rho^- \rho^0$ mode, not independent of the other two EVANGELISTA 81 entries.

²² From $a_2(1320)^- \pi^0$ mode, not independent of the other two EVANGELISTA 81 entries.

²³ From $a_2(1320)^0 \pi^-$ mode, not independent of the other two EVANGELISTA 81 entries.

²⁴ From $\rho^\pm \rho^0$ mode.

$\omega\pi$ MODE

<u>VALUE (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>CHG</u>	<u>COMMENT</u>
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The data in this block is included in the average printed for a previous datablock.

190 ± 40 OUR AVERAGE

230 ± 65		²⁵ ALDE	95	GAM2		38	$\pi^- p \rightarrow$
							$\omega \pi^0 n$
190 ± 65		EVANGELISTA	81	OMEG	-	12	$\pi^- p \rightarrow \omega \pi p$
160 ± 56		GESSAROLI	77	HBC		11	$\pi^- p \rightarrow \omega \pi p$

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

89 ± 25		THOMPSON	74	HBC	+	13	$\pi^+ p$
130 ⁺⁷³ -43		BARNHAM	70	HBC	+	10	$K^+ p \rightarrow \omega \pi X$

²⁵ Supersedes ALDE 92C.

$\eta\pi^+\pi^-$ MODE

(For difficulties with MMS experiments, see the $a_2(1320)$ mini-review in the 1973 edition.)

VALUE (MeV) DOCUMENT ID TECN CHG COMMENT

The data in this block is included in the average printed for a previous datablock.

126 ± 40 OUR AVERAGE Error includes scale factor of 1.8.

220 ± 30 ± 50	AMELIN	00	VES		37 $\pi^- p \rightarrow$ $\eta\pi^+\pi^- n$
106 ± 27	FUKUI	88	SPEC	0	8.95 $\pi^- p \rightarrow$ $\eta\pi^+\pi^- n$

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

195	²⁶ ANDERSON	69	MMS	-	16 $\pi^- p$ backward
< 21	^{26,27} FOCACCI	66	MMS	-	7-12 $\pi^- p \rightarrow$ ρMM
< 30	^{26,27} FOCACCI	66	MMS	-	7-12 $\pi^- p \rightarrow$ ρMM
< 38	^{26,27} FOCACCI	66	MMS	-	7-12 $\pi^- p \rightarrow$ ρMM

²⁶ Seen in 2.5-3 GeV/c $\bar{p}p$. $2\pi^+2\pi^-$, with 0, 1, 2 $\pi^+\pi^-$ pairs in ρ^0 band not seen by OREN 74 (2.3 GeV/c $\bar{p}p$) with more statistics. (Jan. 1979)

²⁷ Not seen by BOWEN 72.

$\rho_3(1690)$ DECAY MODES

Mode	Fraction (Γ_i/Γ)	Scale factor
Γ_1 4π	(71.1 ± 1.9) %	
Γ_2 $\pi^\pm\pi^+\pi^-\pi^0$	(67 ± 22) %	
Γ_3 $\omega\pi$	(16 ± 6) %	
Γ_4 $\pi\pi$	(23.6 ± 1.3) %	
Γ_5 $K\bar{K}\pi$	(3.8 ± 1.2) %	
Γ_6 $K\bar{K}$	(1.58 ± 0.26) %	1.2
Γ_7 $\eta\pi^+\pi^-$	seen	
Γ_8 $\rho(770)\eta$	seen	
Γ_9 $\pi\pi\rho$ Excluding 2ρ and $a_2(1320)\pi$.		
Γ_{10} $a_2(1320)\pi$		
Γ_{11} $\rho\rho$		
Γ_{12} $\phi\pi$		
Γ_{13} $\eta\pi$		
Γ_{14} $\pi^\pm 2\pi^+ 2\pi^- \pi^0$		

CONSTRAINED FIT INFORMATION

An overall fit to 5 branching ratios uses 10 measurements and one constraint to determine 4 parameters. The overall fit has a $\chi^2 = 14.7$ for 7 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_4	-77		
x_5	-74	17	
x_6	-15	2	0
	x_1	x_4	x_5

$\rho_3(1690)$ BRANCHING RATIOS

$\Gamma(\pi\pi)/\Gamma_{\text{total}}$						Γ_4/Γ
<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>CHG</u>	<u>COMMENT</u>		
0.236 ± 0.013 OUR FIT						
0.243 ± 0.013 OUR AVERAGE						
0.259 ^{+0.018} _{-0.019}	BECKER	79	ASPK	0	17	$\pi^- p$ polarized
0.23 ± 0.02	CORDEN	79	OMEG		12-15	$\pi^- p \rightarrow n^2\pi$
0.22 ± 0.04	²⁸ MATTHEWS	71c	HDBC	0	7	$\pi^+ n \rightarrow \pi^- p$
• • • We do not use the following data for averages, fits, limits, etc. • • •						
0.245 ± 0.006	²⁹ ESTABROOKS	75	RVUE		17	$\pi^- p \rightarrow \pi^+ \pi^- n$

²⁸ One-pion-exchange model used in this estimation.

²⁹ From phase-shift analysis of HYAMS 75 data.

$\Gamma(\pi\pi)/\Gamma(\pi^\pm \pi^+ \pi^- \pi^0)$						Γ_4/Γ_2
<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>CHG</u>	<u>COMMENT</u>		
0.35 ± 0.11	CASON	73	HBC	-	8,18.5	$\pi^- p$
• • • We do not use the following data for averages, fits, limits, etc. • • •						
<0.2	HOLMES	72	HBC	+	10-12	$K^+ p$
<0.12	BALLAM	71B	HBC	-	16	$\pi^- p$

$\Gamma(\pi\pi)/\Gamma(4\pi)$						Γ_4/Γ_1
<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>CHG</u>	<u>COMMENT</u>		
0.332 ± 0.026 OUR FIT	Error includes scale factor of 1.1.					
0.30 ± 0.10	BALTAY	78B	HBC	0	15	$\pi^+ p \rightarrow p4\pi$

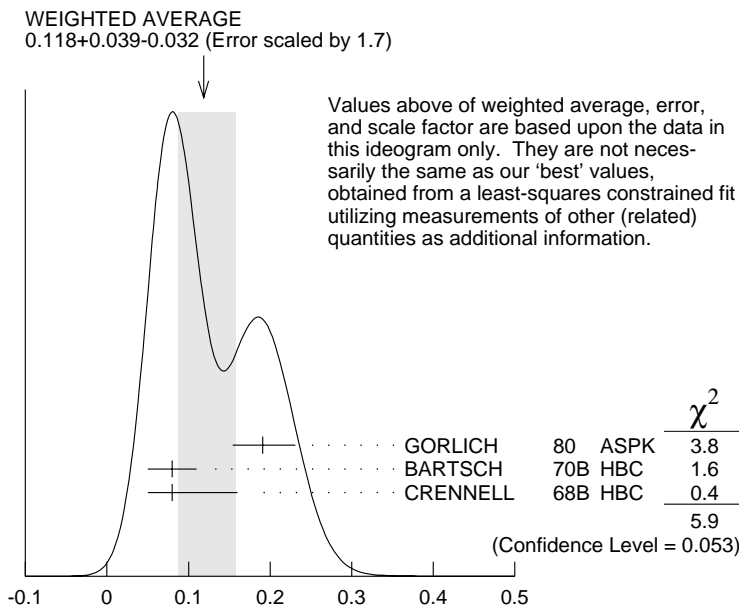
$\Gamma(K\bar{K})/\Gamma(\pi\pi)$

Γ_6/Γ_4

VALUE DOCUMENT ID TECN CHG COMMENT
0.067 ± 0.011 OUR FIT Error includes scale factor of 1.2.

0.118^{+0.039}_{-0.032} OUR AVERAGE Error includes scale factor of 1.7. See the ideogram below.

0.191 ^{+0.040} _{-0.037}	GORLICH	80	ASP	0	17,18 $\pi^- p$ polarized
0.08 ± 0.03	BARTSCH	70B	HBC	+	8 $\pi^+ p$
0.08 ^{+0.08} _{-0.03}	CRENNELL	68B	HBC		6.0 $\pi^- p$



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

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

Γ_5/Γ_4

VALUE DOCUMENT ID TECN CHG COMMENT
0.16 ± 0.05 OUR FIT

0.16 ± 0.05 ³⁰ BARTSCH 70B HBC + 8 $\pi^+ p$

³⁰ Increased by us to correspond to $B(\rho_3(1690) \rightarrow \pi\pi) = 0.24$.

$[\Gamma(\pi\pi\rho) + \Gamma(a_2(1320)\pi) + \Gamma(\rho\rho)]/\Gamma(\pi^\pm\pi^+\pi^-\pi^0)$ ($\Gamma_9+\Gamma_{10}+\Gamma_{11})/\Gamma_2$

VALUE DOCUMENT ID TECN CHG COMMENT
0.94 ± 0.09 OUR AVERAGE

0.96 ± 0.21	BALTAY	78B	HBC	+	15 $\pi^+ p \rightarrow p4\pi$
0.88 ± 0.15	BALLAM	71B	HBC	-	16 $\pi^- p$
1 ± 0.15	BARTSCH	70B	HBC	+	8 $\pi^+ p$
consistent with 1	CASO	68	HBC	-	11 $\pi^- p$

$\Gamma(\rho\rho)/\Gamma(\pi^\pm\pi^+\pi^-\pi^0)$ Γ_{11}/Γ_2

<u>VALUE</u>	<u>EVTs</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>CHG</u>	<u>COMMENT</u>
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• • • We do not use the following data for averages, fits, limits, etc. • • •

0.12±0.11		BALTAY	78B	HBC	+	15 $\pi^+ p \rightarrow p4\pi$
0.56	66	KLIGER	74	HBC	-	4.5 $\pi^- p \rightarrow p4\pi$
0.13±0.09		³¹ THOMPSON	74	HBC	+	13 $\pi^+ p$
0.7 ±0.15		BARTSCH	70B	HBC	+	8 $\pi^+ p$

³¹ $\rho\rho$ and $a_2(1320)\pi$ modes are indistinguishable.

$\Gamma(\rho\rho)/[\Gamma(\pi\pi\rho) + \Gamma(a_2(1320)\pi) + \Gamma(\rho\rho)]$ $\Gamma_{11}/(\Gamma_9+\Gamma_{10}+\Gamma_{11})$

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>CHG</u>	<u>COMMENT</u>
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• • • We do not use the following data for averages, fits, limits, etc. • • •

0.48±0.16	CASO	68	HBC	-	11 $\pi^- p$
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$\Gamma(a_2(1320)\pi)/\Gamma(\pi^\pm\pi^+\pi^-\pi^0)$ Γ_{10}/Γ_2

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>CHG</u>	<u>COMMENT</u>
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• • • We do not use the following data for averages, fits, limits, etc. • • •

0.66±0.08		BALTAY	78B	HBC	+	15 $\pi^+ p \rightarrow p4\pi$
0.36±0.14		³² THOMPSON	74	HBC	+	13 $\pi^+ p$
not seen		CASON	73	HBC	-	8,18.5 $\pi^- p$
0.6 ±0.15		BARTSCH	70B	HBC	+	8 $\pi^+ p$
0.6		BALTAY	68	HBC	+	7,8.5 $\pi^+ p$

³² $\rho\rho$ and $a_2(1320)\pi$ modes are indistinguishable.

$\Gamma(\omega\pi)/\Gamma(\pi^\pm\pi^+\pi^-\pi^0)$ Γ_3/Γ_2

<u>VALUE</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>CHG</u>	<u>COMMENT</u>
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0.23±0.05 OUR AVERAGE Error includes scale factor of 1.2.

0.33±0.07		THOMPSON	74	HBC	+	13 $\pi^+ p$
0.12±0.07		BALLAM	71B	HBC	-	16 $\pi^- p$
0.25±0.10		BALTAY	68	HBC	+	7,8.5 $\pi^+ p$
0.25±0.10		JOHNSTON	68	HBC	-	7.0 $\pi^- p$

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

<0.11	95	BALTAY	78B	HBC	+	15 $\pi^+ p \rightarrow p4\pi$
<0.09		KLIGER	74	HBC	-	4.5 $\pi^- p \rightarrow p4\pi$

$\Gamma(\phi\pi)/\Gamma(\pi^\pm\pi^+\pi^-\pi^0)$ Γ_{12}/Γ_2

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>CHG</u>	<u>COMMENT</u>
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• • • We do not use the following data for averages, fits, limits, etc. • • •

<0.11		BALTAY	68	HBC	+	7,8.5 $\pi^+ p$
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$\Gamma(\pi^\pm 2\pi^+ 2\pi^- \pi^0)/\Gamma(\pi^\pm\pi^+\pi^-\pi^0)$ Γ_{14}/Γ_2

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>CHG</u>	<u>COMMENT</u>
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• • • We do not use the following data for averages, fits, limits, etc. • • •

<0.15		BALTAY	68	HBC	+	7,8.5 $\pi^+ p$
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$\Gamma(\eta\pi)/\Gamma(\pi^\pm\pi^+\pi^-\pi^0)$ Γ_{13}/Γ_2

VALUE	DOCUMENT ID	TECN	CHG	COMMENT
<0.02	THOMPSON 74	HBC	+	$13 \pi^+ p$

$\Gamma(K\bar{K})/\Gamma_{\text{total}}$ Γ_6/Γ

VALUE	DOCUMENT ID	TECN	CHG	COMMENT
0.0158±0.0026 OUR FIT	Error includes scale factor of 1.2.			
0.0130±0.0024 OUR AVERAGE				
0.013 ±0.003	COSTA...	80	OMEG 0	$10 \pi^- p \rightarrow K^+ K^- n$
0.013 ±0.004	³³ MARTIN	78B	SPEC	$10 \pi p \rightarrow K_S^0 K^- p$

³³ From $(\Gamma_4\Gamma_6)^{1/2} = 0.056 \pm 0.034$ assuming $B(\rho_3(1690) \rightarrow \pi\pi) = 0.24$.

$\Gamma(\omega\pi)/[\Gamma(\omega\pi) + \Gamma(\rho\rho)]$ $\Gamma_3/(\Gamma_3+\Gamma_{11})$

VALUE	DOCUMENT ID	TECN	CHG	COMMENT
0.22 ± 0.08	CASON 73	HBC	-	$8,18.5 \pi^- p$

$\Gamma(\eta\pi^+\pi^-)/\Gamma_{\text{total}}$ Γ_7/Γ

VALUE	DOCUMENT ID	TECN	COMMENT
seen	FUKUI 88	SPEC	$8.95 \pi^- p \rightarrow \eta\pi^+\pi^- n$

$\Gamma(a_2(1320)\pi)/\Gamma(\rho(770)\eta)$ Γ_{10}/Γ_8

VALUE	DOCUMENT ID	TECN	COMMENT
5.5±2.0	AMELIN 00	VES	$37 \pi^- p \rightarrow \eta\pi^+\pi^- n$

$\rho_3(1690)$ REFERENCES

AMELIN 00	NP A668 83	D. Amelin <i>et al.</i>	(VES Collab.)
ALDE 95	ZPHY C66 379	D.M. Alde <i>et al.</i>	(GAMS Collab.) JP
ALDE 92C	ZPHY C54 553	D.M. Alde <i>et al.</i>	(BELG, SERP, KEK, LANL+)
FUKUI 88	PL B202 441	S. Fukui <i>et al.</i>	(SUGI, NAGO, KEK, KYOT+)
DENNEY 83	PR D28 2726	D.L. Denney <i>et al.</i>	(IOWA, MICH)
EVANGELISTA 81	NP B178 197	C. Evangelista <i>et al.</i>	(BARI, BONN, CERN+)
ALPER 80	PL 94B 422	B. Alper <i>et al.</i>	(AMST, CERN, CRAC, MPIM+)
COSTA... 80	NP B175 402	G. Costa de Beauregard <i>et al.</i>	(BARI, BONN+)
GORLICH 80	NP B174 16	L. Gorlich <i>et al.</i>	(CRAC, MPIM, CERN+)
BECKER 79	NP B151 46	H. Becker <i>et al.</i>	(MPIM, CERN, ZEEM, CRAC)
CORDEN 79	NP B157 250	M.J. Corden <i>et al.</i>	(BIRM, RHEL, TELA+) JP
BALTAY 78B	PR D17 62	C. Baltay <i>et al.</i>	(COLU, BING)
MARTIN 78B	NP B140 158	A.D. Martin <i>et al.</i>	(DURH, GEVA)
MARTIN 78D	PL 74B 417	A.D. Martin <i>et al.</i>	(DURH, GEVA)
ANTIPOV 77	NP B119 45	Y.M. Antipov <i>et al.</i>	(SERP, GEVA)
GESSAROLI 77	NP B126 382	R. Gessaroli <i>et al.</i>	(BGNA, FIRZ, GENO+)
BLUM 75	PL 57B 403	W. Blum <i>et al.</i>	(CERN, MPIM) JP
ESTABROOKS 75	NP B95 322	P.G. Estabrooks, A.D. Martin	(DURH)
HYAMS 75	NP B100 205	B.D. Hyams <i>et al.</i>	(CERN, MPIM)
ENGLER 74	PR D10 2070	A. Engler <i>et al.</i>	(CMU, CASE)
GRAYER 74	NP B75 189	G. Grayer <i>et al.</i>	(CERN, MPIM)
KLIGER 74	SJNP 19 428	G.K. Kliger <i>et al.</i>	(ITEP)

Translated from YAF 19 839.

OREN	74	NP B71 189	Y. Oren <i>et al.</i>	(ANL, OXF)
THOMPSON	74	NP B69 220	G. Thompson <i>et al.</i>	(PURD)
CASON	73	PR D7 1971	N.M. Cason <i>et al.</i>	(NDAM)
BOWEN	72	PRL 29 890	D.R. Bowen <i>et al.</i>	(NEAS, STON)
HOLMES	72	PR D6 3336	R. Holmes <i>et al.</i>	(ROCH)
BALLAM	71B	PR D3 2606	J. Ballam <i>et al.</i>	(SLAC)
MATTHEWS	71C	NP B33 1	J.A.J. Matthews <i>et al.</i>	(TNTO, WISC) JP
ARMENISE	70	LNC 4 199	N. Armenise <i>et al.</i>	(BARI, BGNA, FIRZ)
BARNHAM	70	PRL 24 1083	K.W.J. Barnham <i>et al.</i>	(BIRM)
BARTSCH	70B	NP B22 109	J. Bartsch <i>et al.</i>	(AACH, BERL, CERN)
CASO	70	LNC 3 707	C. Caso <i>et al.</i>	(GENO, HAMB, MILA, SACL)
STUNTEBECK	70	PL 32B 391	P.H. Stuntebeck <i>et al.</i>	(NDAM)
ADERHOLZ	69	NP B11 259	M. Aderholz <i>et al.</i>	(AACH3, BERL, CERN+)
ANDERSON	69	PRL 22 1390	E.W. Anderson <i>et al.</i>	(BNL, CMU)
ARMENISE	68	NC 54A 999	N. Armenise <i>et al.</i>	(BARI, BGNA, FIRZ+) I
BALTAY	68	PRL 20 887	C. Baltay <i>et al.</i>	(COLU, ROCH, RUTG, YALE) I
CASO	68	NC 54A 983	C. Caso <i>et al.</i>	(GENO, HAMB, MILA, SACL)
CRENNELL	68B	PL 28B 136	D.J. Crennell <i>et al.</i>	(BNL)
JOHNSTON	68	PRL 20 1414	T.F. Johnston <i>et al.</i>	(TNTO, WISC) IJP
FOCACCI	66	PRL 17 890	M.N. Focacci <i>et al.</i>	(CERN)
GOLDBERG	65	PL 17 354	M. Goldberg <i>et al.</i>	(CERN, EPOL, ORSAY+)

OTHER RELATED PAPERS

BARNETT	83B	PL 120B 455	B. Barnett <i>et al.</i>	(JHU)
EHRlich	66	PR 152 1194	R. Ehrlich, W. Selove, H. Yuta	(PENN)
LEVRAT	66	PL 22 714	B. Levrat <i>et al.</i>	
SEGUINOT	66	PL 19 712	J. Seguinot <i>et al.</i>	
BELLINI	65	NC 40A 948	G. Bellini <i>et al.</i>	(MILA)
DEUTSCH...	65	PL 18 351	M. Deutschmann <i>et al.</i>	(AACH3, BERL, CERN)
FORINO	65	PL 19 65	A. Forino <i>et al.</i>	(BGNA, ORSAY, SACL)