

$\rho_3(1690)$

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

$\rho_3(1690)$ MASS

VALUE (MeV)DOCUMENT ID**1688.8 ± 2.1 OUR AVERAGE** Includes data from the 5 datablocks that follow this one.

2 π MODE

VALUE (MeV)EVTSDOCUMENT IDTECNCHGCOMMENT

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

1686 ± 4 OUR AVERAGE

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

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

1696 ± 4 OUR AVERAGE

1699 ± 5		ALPER	80	CNTR	0	62 $\pi^- p \rightarrow$ $K^+ K^- n$
1698 ± 12	6k	^{5,6} MARTIN	78D	SPEC		10 $\pi p \rightarrow$ $K_S^0 K^- p$
1692 ± 6		BLUM	75	ASPK	0	18.4 $\pi^- p \rightarrow$ $n K^+ K^-$
1690 ± 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 $\omega_3(1670)$.

$(4\pi)^\pm$ 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.

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

1694 ± 6		⁸ EVANGELIS...	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 EVANGELIS...	81	OMEG	-	12 $\pi^- p \rightarrow p4\pi$
1673 ± 9		¹¹ EVANGELIS...	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

<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.

1681 ± 7 OUR AVERAGE

1670 ± 25		¹² ALDE	95	GAM2		38 $\pi^- p \rightarrow \omega\pi^0 n$
1690 ± 15		EVANGELIS...	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.

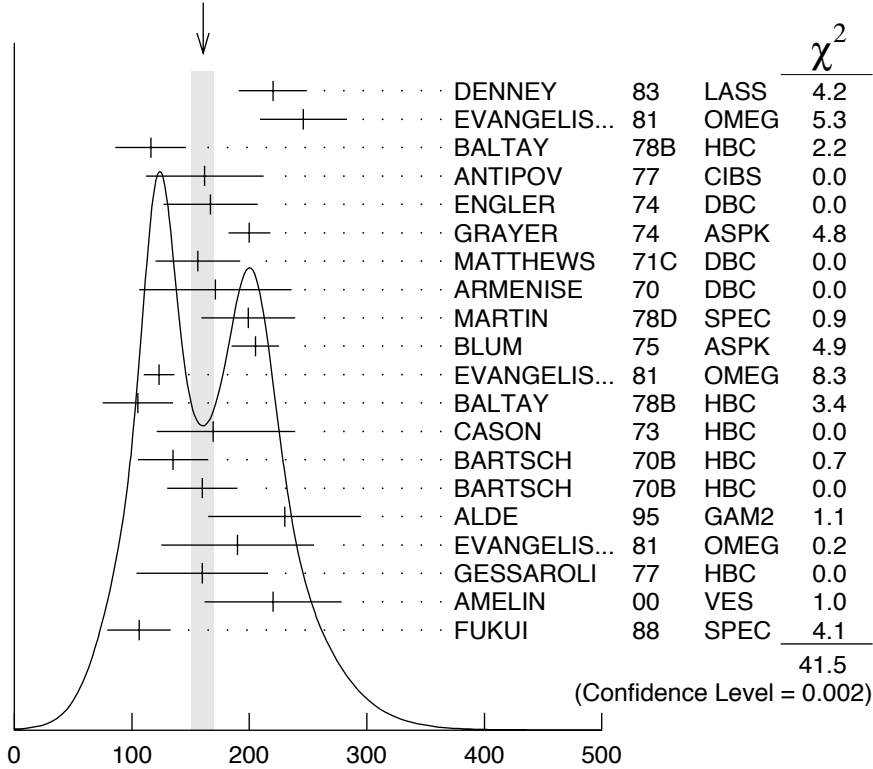
$\rho_3(1690)$ WIDTH

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

<u>VALUE (MeV)</u>	<u>DOCUMENT ID</u>
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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.

WEIGHTED AVERAGE
 161 ± 10 (Error scaled by 1.5)



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

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.

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		EVANGELIS...	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 $\pi^- p \rightarrow p 3\pi$
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 $\pi^- p \rightarrow$ $n 2\pi$
240 ± 30		^{16,18} ESTABROOKS	75	RVUE	17 $\pi^- p \rightarrow$ $\pi^+ \pi^- n$
180 ± 30	122	BARTSCH	70B	HBC	+ 8 $\pi^+ p \rightarrow N 2\pi$

267^{+72}_{-46}	STUNTEBECK 70	HDBC	0	$8 \pi^- p, 5.4 \pi^+ d$
188 ± 49	ARMENISE	68	DBC	$5.1 \pi^+ d$
180 ± 40	GOLDBERG	65	HBC	$6 \pi^+ d, 8 \pi^- p$

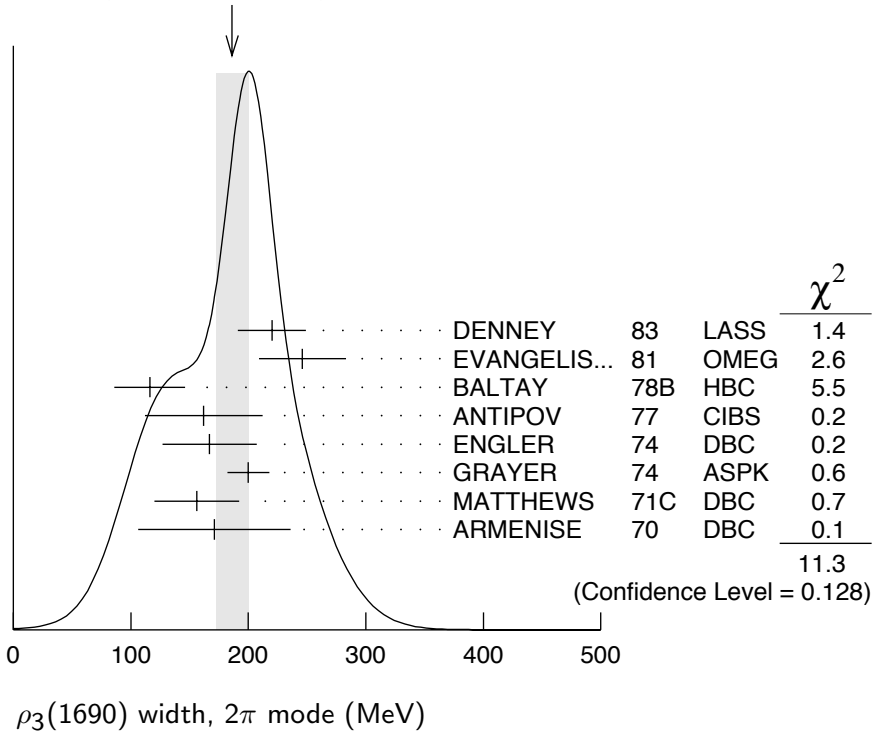
¹⁵ Width errors enlarged by us to $4\Gamma/\sqrt{N}$; see the note with the $K^*(892)$ mass.

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.

WEIGHTED AVERAGE
 186 ± 14 (Error scaled by 1.3)



$K\bar{K}$ 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 $\pi^- p \rightarrow n K^+ K^-$
● ● ● 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 π) $^\pm$ 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.

129 \pm 10 OUR AVERAGE

123 \pm 13		21 EVANGELIS...	81	OMEG	-	12 $\pi^- p \rightarrow p4\pi$
105 \pm 30	177	BALTAY	78B	HBC	+	15 $\pi^+ p \rightarrow p4\pi$
169 $^{+70}_{-48}$		CASON	73	HBC	-	8,18.5 $\pi^- p$
135 \pm 30	144	BARTSCH	70B	HBC	+	8 $\pi^+ p \rightarrow N4\pi$
160 \pm 30	102	BARTSCH	70B	HBC	+	8 $\pi^+ p \rightarrow N2\rho$

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

230 \pm 28		22 EVANGELIS...	81	OMEG	-	12 $\pi^- p \rightarrow p4\pi$
184 \pm 33		23 EVANGELIS...	81	OMEG	-	12 $\pi^- p \rightarrow p4\pi$
150	66	24 KLIGER	74	HBC	-	4.5 $\pi^- p \rightarrow p4\pi$
106 \pm 25		THOMPSON	74	HBC	+	13 $\pi^+ p$
125 $^{+83}_{-35}$		24 CASON	73	HBC	-	8,18.5 $\pi^- p$
130 \pm 30		HOLMES	72	HBC	+	10-12 $K^+ p$
180 \pm 30	90	24 BARTSCH	70B	HBC	+	8 $\pi^+ p \rightarrow Na_2\pi$
100 \pm 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**

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.

190 \pm 40 OUR AVERAGE

230 \pm 65		25 ALDE	95	GAM2		38 $\pi^- p \rightarrow \omega\pi^0 n$
190 \pm 65		EVANGELIS...	81	OMEG	-	12 $\pi^- p \rightarrow \omega\pi p$
160 \pm 56		GESSAROLI	77	HBC		11 $\pi^- p \rightarrow \omega\pi p$
89 \pm 25		THOMPSON	74	HBC	+	13 $\pi^+ p$
130 $^{+73}_{-43}$		BARNHAM	70	HBC	+	10 $K^+ p \rightarrow \omega\pi X$

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

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

126 \pm 40 OUR AVERAGE Error includes scale factor of 1.8.

220 \pm 30 \pm 50	AMELIN	00	VES		37 $\pi^- p \rightarrow \eta\pi^+\pi^- n$
106 \pm 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 $\pi^- \rho$ backward
< 21	^{26,27} FOCACCI	66	MMS	—	7–12 $\pi^- \rho \rightarrow \rho MM$
< 30	^{26,27} FOCACCI	66	MMS	—	7–12 $\pi^- \rho \rightarrow \rho MM$
< 38	^{26,27} FOCACCI	66	MMS	—	7–12 $\pi^- \rho \rightarrow \rho MM$

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 \pm 1.9) %	
Γ_2 $\pi^\pm \pi^+ \pi^- \pi^0$	(67 \pm 22) %	
Γ_3 $\omega \pi$	(16 \pm 6) %	
Γ_4 $\pi \pi$	(23.6 \pm 1.3) %	
Γ_5 $K \bar{K} \pi$	(3.8 \pm 1.2) %	
Γ_6 $K \bar{K}$	(1.58 \pm 0.26) %	1.2
Γ_7 $\eta \pi^+ \pi^-$	seen	
Γ_8 $\rho(770)\eta$	seen	
Γ_9 $\pi \pi \rho$	seen	
Excluding 2ρ and $a_2(1320)\pi$.		
Γ_{10} $a_2(1320)\pi$	seen	
Γ_{11} $\rho \rho$	seen	
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 $\langle \delta x_i \delta x_j \rangle / (\delta x_i \cdot \delta x_j)$, 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_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 $\pi^- p \rightarrow n2\pi$
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 $\pi^- p$

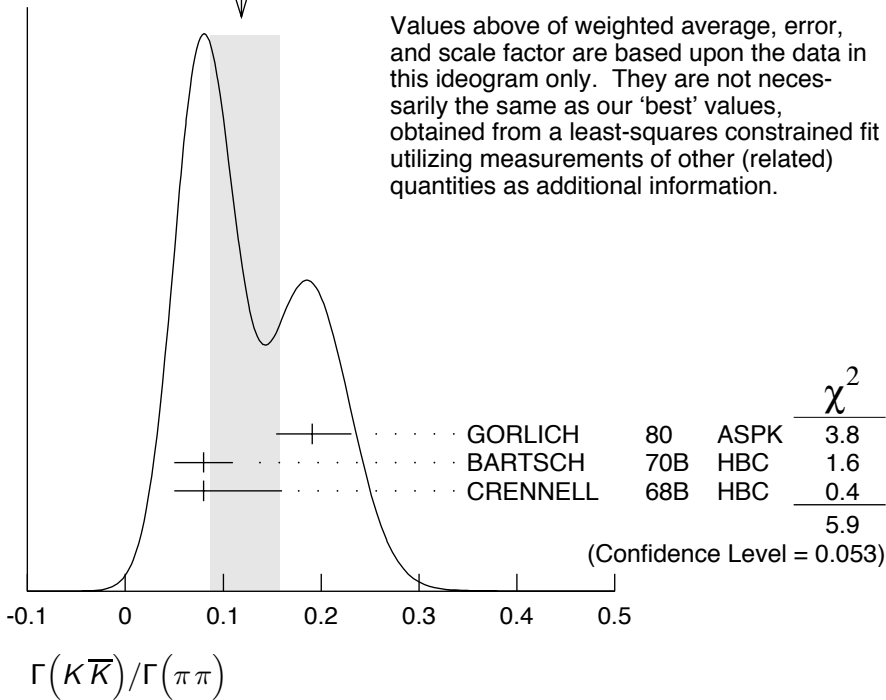
$\Gamma(\pi\pi)/\Gamma(4\pi)$ Γ_4/Γ_1

<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

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>CHG</u>	<u>COMMENT</u>
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	ASPK	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 $\pi^- p$

WEIGHTED AVERAGE
0.118±0.039-0.032 (Error scaled by 1.7)



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

VALUE	DOCUMENT ID	TECN	CHG	COMMENT	Γ_5 / Γ_4
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 $\pi^+ p \rightarrow p 4\pi$
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 $\pi^- p$

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

VALUE	EVTS	DOCUMENT ID	TECN	CHG	COMMENT	Γ_{11} / Γ_2
0.12±0.11		BALTAY	78B	HBC	+ 15 $\pi^+ p \rightarrow p 4\pi$	
0.56	66	KLIGER	74	HBC	- 4.5 $\pi^- p \rightarrow p 4\pi$	
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.

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

VALUE DOCUMENT ID TECN CHG COMMENT

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

0.48±0.16 CASO 68 HBC - 11 $\pi^- p$

$\Gamma(a_2(1320)\pi)/\Gamma(\pi^\pm\pi^+\pi^-\pi^0)$ Γ_{10}/Γ_2

VALUE DOCUMENT ID TECN CHG COMMENT

• • • 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

VALUE CL% DOCUMENT ID TECN CHG COMMENT

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

VALUE DOCUMENT ID TECN CHG COMMENT

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

<0.11 BALTAY 68 HBC + 7,8.5 $\pi^+ p$

$\Gamma(\pi^\pm 2\pi^+ 2\pi^- \pi^0)/\Gamma(\pi^\pm\pi^+\pi^-\pi^0)$ Γ_{14}/Γ_2

VALUE DOCUMENT ID TECN CHG COMMENT

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

<0.15 BALTAY 68 HBC + 7,8.5 $\pi^+ p$

$\Gamma(\eta\pi)/\Gamma(\pi^\pm\pi^+\pi^-\pi^0)$ Γ_{13}/Γ_2

VALUE DOCUMENT ID TECN CHG COMMENT

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

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