$\rho_3(1690)$

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

$\rho_3(1690)$ MASS

VALUE (MeV) DOCUMENT ID

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

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.							

1686± 4 OUR AVERAGE

1677±14			EVANGELIS...	81	OMEG	−	12 $\pi^- p \to 2\pi p$
1679±11	476		BALTAY	78B	HBC	0	15 $\pi^+ p \to \pi^+\pi^- n$
1678±12	175	[1]	ANTIPOV	77	CIBS	0	25 $\pi^- p \to p 3\pi$
1690± 7	600	[1]	ENGLER	74	DBC	0	6 $\pi^+ n \to \pi^+\pi^- p$
1693± 8		[2]	GRAYER	74	ASPK	0	17 $\pi^- p \to \pi^+\pi^- n$
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 $\pi^- p \to n 2\pi$
1692±12		[2,4]	ESTABROOKS	75	RVUE		17 $\pi^- p \to \pi^+\pi^- n$
1737±23			ARMENISE	70	DBC	0	9 $\pi^+ N$
1650±35	122		BARTSCH	70B	HBC	+	8 $\pi^+ p \to N 2\pi$
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 $\Gamma/\sqrt{N}$; 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 $K\overline{K}$ result.
[4] From phase-shift analysis. Error takes account of spread of different phase-shift solutions.

$K\overline{K}$ AND $K\overline{K}\pi$ 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± 4 OUR AVERAGE

1699± 5			ALPER	80	CNTR	0	62 $\pi^- p \to K^+ K^- n$
1698±12	6k	[5,6]	MARTIN	78D	SPEC		10 $\pi p \to K^0_S K^- p$
1692± 6			BLUM	75	ASPK	0	18.4 $\pi^- p \to n K^+ K^-$
1690±16			ADERHOLZ	69	HBC	+	8 $\pi^+ p \to K\overline{K}\pi$

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

1694± 8		[7]	COSTA	80	OMEG		10 $\pi^- p \to K^+ K^- n$

[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

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	CHG	COMMENT
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.

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	CHG	COMMENT
1694± 6		[8] EVANGELIS...	81	OMEG	−	12 $\pi^- p \to p 4\pi$
1665±15	177	BALTAY	78B	HBC	+	15 $\pi^+ p \to p 4\pi$
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 $\pi^+ p \to N 4\pi$
1689±20	102	[9] BARTSCH	70B	HBC	+	8 $\pi^+ p \to N 2\rho$
1705±21		CASO	70	HBC	−	11.2 $\pi^- p \to n\rho 2\pi$

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

1718±10		[10] EVANGELIS...	81	OMEG	−	12 $\pi^- p \to p 4\pi$
1673± 9		[11] EVANGELIS...	81	OMEG	−	12 $\pi^- p \to p 4\pi$
1733± 9	66	[9] KLIGER	74	HBC	−	4.5 $\pi^- p \to p 4\pi$
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
The data in this block is included in the average printed for a previous datablock.					

1681± 7 OUR AVERAGE

VALUE (MeV)	DOCUMENT ID		TECN	CHG	COMMENT
1670±25	[12] ALDE	95	GAM2		38 $\pi^- p \to \omega\pi^0 n$
1690±15	EVANGELIS...	81	OMEG	−	12 $\pi^- p \to \omega\pi p$
1666±14	GESSAROLI	77	HBC		11 $\pi^- p \to \omega\pi p$
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 $K^+ p \to \omega\pi X$

[12] 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.					

1682±12 OUR AVERAGE
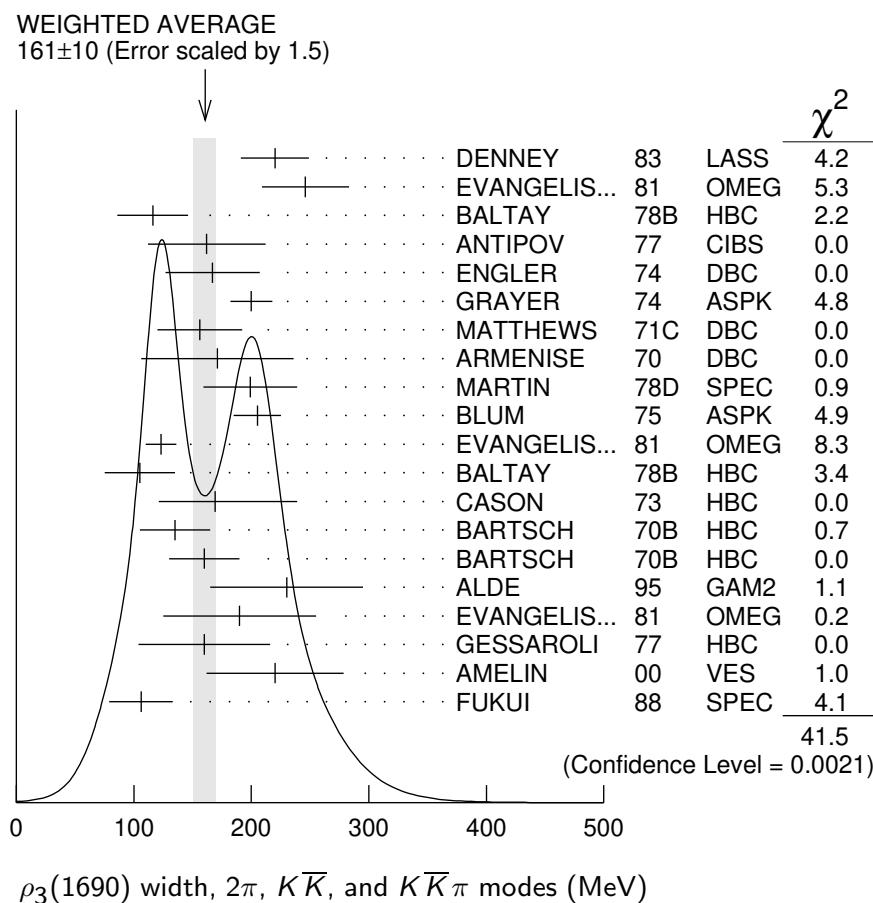
VALUE (MeV)	DOCUMENT ID		TECN	CHG	COMMENT
1685±10±20	AMELIN	00	VES		37 $\pi^- p \to \eta\pi^+\pi^- n$
1680±15	FUKUI	88	SPEC	0	8.95 $\pi^- p \to \eta\pi^+\pi^- n$

• • • 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 $\pi^- p \to p$MM
1700±15	[13,14] FOCACCI	66	MMS	−	7–12 $\pi^- p \to p$MM

1748±15	[13,14] FOCACCI	66	MMS	−	7–12 $\pi^- p \to p$ MM

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

[14] Not seen by BOWEN 72.

$\rho_3(1690)$ WIDTH

2π, $K\overline{K}$, AND $K\overline{K}\pi$ 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.

WEIGHTED AVERAGE
161±10 (Error scaled by 1.5)

			χ^2
DENNEY	83	LASS	4.2
EVANGELIS...	81	OMEG	5.3
BALTAY	78B	HBC	2.2
ANTIPOV	77	CIBS	0.0
ENGLER	74	DBC	0.0
GRAYER	74	ASPK	4.8
MATTHEWS	71C	DBC	0.0
ARMENISE	70	DBC	0.0
MARTIN	78D	SPEC	0.9
BLUM	75	ASPK	4.9
EVANGELIS...	81	OMEG	8.3
BALTAY	78B	HBC	3.4
CASON	73	HBC	0.0
BARTSCH	70B	HBC	0.7
BARTSCH	70B	HBC	0.0
ALDE	95	GAM2	1.1
EVANGELIS...	81	OMEG	0.2
GESSAROLI	77	HBC	0.0
AMELIN	00	VES	1.0
FUKUI	88	SPEC	4.1
			41.5

(Confidence Level = 0.0021)

$\rho_3(1690)$ width, 2π, $K\overline{K}$, and $K\overline{K}\pi$ 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		EVANGELIS...	81	OMEG	−	12 $\pi^- p \to 2\pi p$
116±30	476	BALTAY	78B	HBC	0	15 $\pi^+ p \to \pi^+\pi^- n$
162±50	175	[15] ANTIPOV	77	CIBS	0	25 $\pi^- p \to p3\pi$
167±40	600	ENGLER	74	DBC	0	6 $\pi^+ n \to \pi^+\pi^- p$
200±18		[16] GRAYER	74	ASPK	0	17 $\pi^- p \to \pi^+\pi^- n$
156±36		MATTHEWS	71C	DBC	0	7 $\pi^+ N$
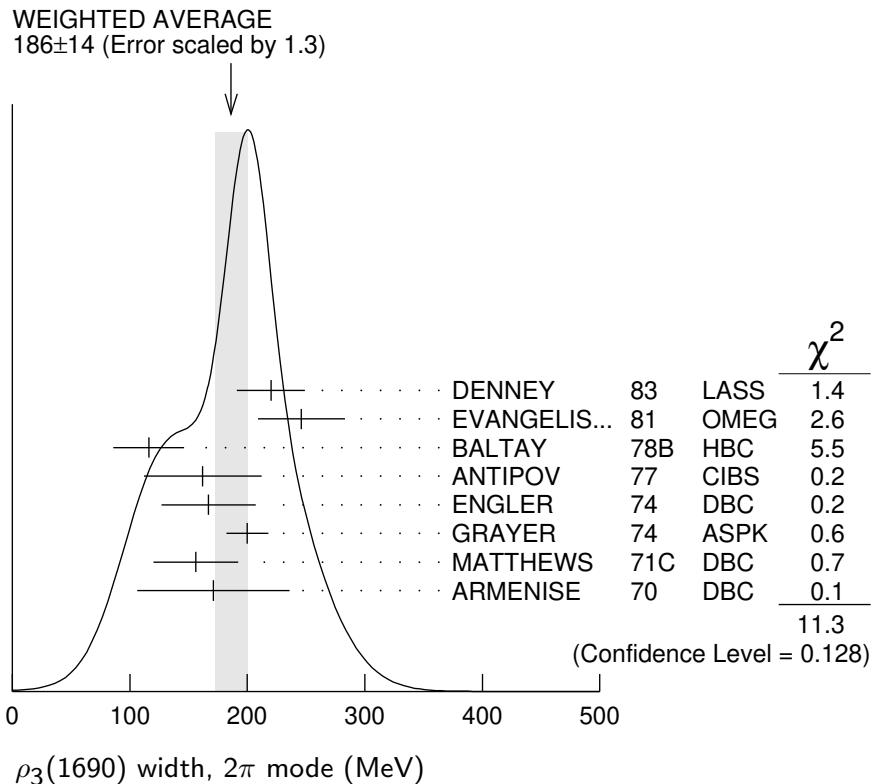
171 ± 65		ARMENISE	70	DBC	0	$9\ \pi^+ d$

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

|					
322 ± 35	[17]	CORDEN	79	OMEG	$12\text{–}15\ \pi^- p \to\ n2\pi$
240 ± 30	[16,18]	ESTABROOKS	75	RVUE	$17\ \pi^- p \to\ \pi^+\pi^- n$
180 ± 30	122	BARTSCH	70B	HBC	+	$8\ \pi^+ p \to\ N2\pi$
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 $K\overline{K}$ 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)

			χ^2
DENNEY	83	LASS	1.4
EVANGELIS...	81	OMEG	2.6
BALTAY	78B	HBC	5.5
ANTIPOV	77	CIBS	0.2
ENGLER	74	DBC	0.2
GRAYER	74	ASPK	0.6
MATTHEWS	71C	DBC	0.7
ARMENISE	70	DBC	0.1
			11.3

(Confidence Level = 0.128)

$\rho_3(1690)$ width, 2π mode (MeV)

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

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	CHG	COMMENT

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

204 ± 18 OUR AVERAGE

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

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

$219\pm\ 4$			ALPER	80	CNTR	0	$62\ \pi^- p \to\ K^+ K^- n$
186 ± 11		[20]	COSTA	80	OMEG	$10\ \pi^- p \to\ K^+ K^- n$
112 ± 60			ADERHOLZ	69	HBC	+	$8\ \pi^+ p \to\ K\overline{K}\pi$

[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

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	CHG	COMMENT

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

129±10 OUR AVERAGE

VALUE (MeV)	EVTS		DOCUMENT ID		TECN	CHG	COMMENT
123±13		[21]	EVANGELIS...	81	OMEG	−	12 $\pi^- p \to p4\pi$
105±30	177		BALTAY	78B	HBC	+	15 $\pi^+ p \to p4\pi$
169^{+70}_{-48}			CASON	73	HBC	−	8,18.5 $\pi^- p$
135±30	144		BARTSCH	70B	HBC	+	8 $\pi^+ p \to N4\pi$
160±30	102		BARTSCH	70B	HBC	+	8 $\pi^+ p \to N2\rho$

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

VALUE (MeV)	EVTS		DOCUMENT ID		TECN	CHG	COMMENT
230±28		[22]	EVANGELIS...	81	OMEG	−	12 $\pi^- p \to p4\pi$
184±33		[23]	EVANGELIS...	81	OMEG	−	12 $\pi^- p \to p4\pi$
150	66	[24]	KLIGER	74	HBC	−	4.5 $\pi^- p \to p4\pi$
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 $\pi^+ p \to N a_2 \pi$
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

VALUE (MeV)		DOCUMENT ID		TECN	CHG	COMMENT

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

190±40 OUR AVERAGE

VALUE (MeV)		DOCUMENT ID		TECN	CHG	COMMENT
230±65	[25]	ALDE	95	GAM2		38 $\pi^- p \to \omega\pi^0 n$
190±65		EVANGELIS...	81	OMEG	−	12 $\pi^- p \to \omega\pi p$
160±56		GESSAROLI	77	HBC		11 $\pi^- p \to \omega\pi p$

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

VALUE (MeV)		DOCUMENT ID		TECN	CHG	COMMENT
89±25		THOMPSON	74	HBC	+	13 $\pi^+ p$
130^{+73}_{-43}		BARNHAM	70	HBC	+	10 $K^+ p \to \omega\pi X$

[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.

130±40 OUR AVERAGE Error includes scale factor of 1.8.

VALUE (MeV)		DOCUMENT ID		TECN	CHG	COMMENT
220±30±50		AMELIN	00	VES		37 $\pi^- p \to \eta\pi^+\pi^- n$
106±27		FUKUI	88	SPEC	0	8.95 $\pi^- p \to \eta\pi^+\pi^- n$

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

VALUE (MeV)		DOCUMENT ID		TECN	CHG	COMMENT
195	[26]	ANDERSON	69	MMS	−	16 $\pi^- p$ backward
< 21	[26,27]	FOCACCI	66	MMS	−	7–12 $\pi^- p \to p$MM

< 30	[26,27] FOCACCI	66	MMS	−	7–12 $\pi^- p \to p$ MM
< 38	[26,27] FOCACCI	66	MMS	−	7–12 $\pi^- p \to p$ MM

[26] Seen in 2.5–3 GeV/c $\overline{p}p$. $2\pi^+ 2\pi^-$, with 0, 1, 2 $\pi^+\pi^-$ pairs in ρ^0 band not seen by OREN 74 (2.3 GeV/c $\overline{p}p$) 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	$K\overline{K}\pi$	$(3.8 \pm 1.2\ )\ \%$	
Γ_6	$K\overline{K}$	$(1.58 \pm 0.26)\ \%$	1.2
Γ_7	$\eta\pi^+\pi^-$	seen	
Γ_8	$\rho(770)\eta$	seen	
Γ_9	$\pi\pi\rho$	seen	
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 $\left\langle \delta x_i \delta x_j \right\rangle/(\delta x_i \cdot \delta x_j)$, 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_4	−77		
x_5	−74	17	
x_6	−15	2	0
	x_1	x_4	x_5

$\rho_3(1690)$ BRANCHING RATIOS

$\Gamma(\pi\pi)/\Gamma_{\text{total}}$ $\hfill$ **Γ_4/Γ**

VALUE	DOCUMENT ID	TECN	CHG	COMMENT
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
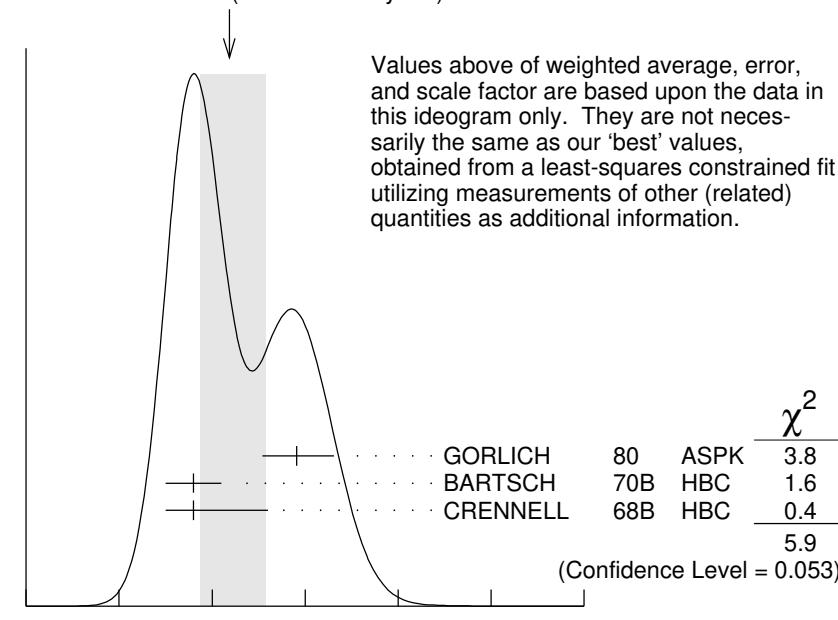
0.23 ±0.02		CORDEN	79	OMEG		12–15 $\pi^- p \to n2\pi$
0.22 ±0.04	[28]	MATTHEWS	71C	HDBC	0	7 $\pi^+ n \to \pi^- p$

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

0.245±0.006	[29]	ESTABROOKS	75	RVUE		17 $\pi^- p \to \pi^+ \pi^- n$

[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

VALUE	DOCUMENT ID		TECN	CHG	COMMENT
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

VALUE	DOCUMENT ID		TECN	CHG	COMMENT
0.332±0.026 OUR FIT Error includes scale factor of 1.1.					
0.30 ±0.10	BALTAY	78B	HBC	0	15 $\pi^+ p \to p4\pi$

$\Gamma(K\overline{K})/\Gamma(\pi\pi)$ 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$^{+0.040}_{-0.032}$ 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+0.040-0.032 (Error scaled by 1.7)

Values above of weighted average, error, and scale factor are based upon the data in this ideogram only. They are not necessarily the same as our 'best' values, obtained from a least-squares constrained fit utilizing measurements of other (related) quantities as additional information.

			χ^2
GORLICH	80	ASPK	3.8
BARTSCH	70B	HBC	1.6
CRENNELL	68B	HBC	0.4
			5.9

(Confidence Level = 0.053)

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

$\Gamma(K\overline{K}\pi)/\Gamma(\pi\pi)$ $\qquad$ 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($\rho_3(1690) \to \pi\pi$)=0.24.

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

VALUE	DOCUMENT ID	TECN	CHG	COMMENT
0.94±0.09 OUR AVERAGE				
0.96±0.21	BALTAY	78B HBC	+	15 $\pi^+ p \to p4\pi$
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 $\pi^- p$

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

VALUE	EVTS	DOCUMENT ID	TECN	CHG	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.12±0.11		BALTAY	78B HBC	+	15 $\pi^+ p \to p4\pi$
0.56	66	KLIGER	74 HBC	−	4.5 $\pi^- p \to p4\pi$
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.

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

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 $\pi^- p$

$\Gamma(a_2(1320)\pi)/\Gamma(\pi^\pm\pi^+\pi^-\pi^0)$ $\qquad$ 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 $\pi^+ p \to p4\pi$
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.

$\Gamma(\omega\pi)/\Gamma(\pi^\pm\pi^+\pi^-\pi^0)$ $\qquad$ 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 $\pi^+ p \to p4\pi$
<0.09		KLIGER	74 HBC	−	4.5 $\pi^- p \to p4\pi$

$\Gamma(\phi\pi)/\Gamma(\pi^{\pm}\pi^{+}\pi^{-}\pi^{0})$ $\qquad$ 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 $\pi^{+} p$

$\Gamma(\pi^{\pm}2\pi^{+}2\pi^{-}\pi^{0})/\Gamma(\pi^{\pm}\pi^{+}\pi^{-}\pi^{0})$ $\qquad$ 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 $\pi^{+} p$

$\Gamma(\eta\pi)/\Gamma(\pi^{\pm}\pi^{+}\pi^{-}\pi^{0})$ $\qquad$ 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 $\pi^{+} p$

$\Gamma(K\overline{K})/\Gamma_{\text{total}}$ $\qquad$ 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 $\pi^{-} p \to K^{+} K^{-} n$
0.013 ±0.004	[33] MARTIN 78B	SPEC	−	10 $\pi p \to K^{0}_{S} K^{-} p$

[33] From $(\Gamma_{4}\Gamma_{6})^{1/2} = 0.056 \pm 0.034$ assuming $B(\rho_{3}(1690) \to \pi\pi) = 0.24$.

$\Gamma(\omega\pi)/[\Gamma(\omega\pi) + \Gamma(\rho\rho)]$ $\qquad$ $\Gamma_{3}/(\Gamma_{3}+\Gamma_{11})$

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 $\pi^{-} p$

$\Gamma(\eta\pi^{+}\pi^{-})/\Gamma_{\text{total}}$ $\qquad$ Γ_{7}/Γ

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

$\Gamma(a_{2}(1320)\pi)/\Gamma(\rho(770)\eta)$ $\qquad$ Γ_{10}/Γ_{8}

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

$\rho_{3}(1690)$ REFERENCES

AMELIN	00	NP A668 83	D. Amelin *et al.*	(VES Collab.)
ALDE	95	ZPHY C66 379	D.M. Alde *et al.*	(GAMS Collab.) JP
ALDE	92C	ZPHY C54 553	D.M. Alde *et al.*	(BELG, SERP, KEK, LANL+)
FUKUI	88	PL B202 441	S. Fukui *et al.*	(SUGI, NAGO, KEK, KYOT+)
DENNEY	83	PR D28 2726	D.L. Denney *et al.*	(IOWA, MICH)
EVANGELIS...	81	NP B178 197	C. Evangelista *et al.*	(BARI, BONN, CERN+)
ALPER	80	PL 94B 422	B. Alper *et al.*	(AMST, CERN, CRAC, MPIM+)
COSTA	80	NP B175 402	G. Costa *et al.*	(BARI, BONN, CERN, GLAS+)
GORLICH	80	NP B174 16	L. Gorlich *et al.*	(CRAC, MPIM, CERN+)
BECKER	79	NP B151 46	H. Becker *et al.*	(MPIM, CERN, ZEEM, CRAC)
CORDEN	79	NP B157 250	M.J. Corden *et al.*	(BIRM, RHEL, TELA+) JP
BALTAY	78B	PR D17 62	C. Baltay *et al.*	(COLU, BING)
MARTIN	78B	NP B140 158	A.D. Martin *et al.*	(DURH, GEVA)
MARTIN	78D	PL 74B 417	A.D. Martin *et al.*	(DURH, GEVA)

ANTIPOV	77	NP B119 45	Y.M. Antipov *et al.*	(SERP, GEVA)
GESSAROLI	77	NP B126 382	R. Gessaroli *et al.*	(BGNA, FIRZ, GENO+)
BLUM	75	PL 57B 403	W. Blum *et al.*	(CERN, MPIM) JP
ESTABROOKS	75	NP B95 322	P.G. Estabrooks, A.D. Martin	(DURH)
HYAMS	75	NP B100 205	B.D. Hyams *et al.*	(CERN, MPIM)
ENGLER	74	PR D10 2070	A. Engler *et al.*	(CMU, CASE)
GRAYER	74	NP B75 189	G. Grayer *et al.*	(CERN, MPIM)
KLIGER	74	SJNP 19 428	G.K. Kliger *et al.*	(ITEP)
		Translated from YAF 19 839.		
OREN	74	NP B71 189	Y. Oren *et al.*	(ANL, OXF)
THOMPSON	74	NP B69 220	G. Thompson *et al.*	(PURD)
CASON	73	PR D7 1971	N.M. Cason *et al.*	(NDAM)
BOWEN	72	PRL 29 890	D.R. Bowen *et al.*	(NEAS, STON)
HOLMES	72	PR D6 3336	R. Holmes *et al.*	(ROCH)
BALLAM	71B	PR D3 2606	J. Ballam *et al.*	(SLAC)
MATTHEWS	71C	NP B33 1	J.A.J. Matthews *et al.*	(TNTO, WISC) JP
ARMENISE	70	LNC 4 199	N. Armenise *et al.*	(BARI, BGNA, FIRZ)
BARNHAM	70	PRL 24 1083	K.W.J. Barnham *et al.*	(BIRM)
BARTSCH	70B	NP B22 109	J. Bartsch *et al.*	(AACH, BERL, CERN)
CASO	70	LNC 3 707	C. Caso *et al.*	(GENO, HAMB, MILA, SACL)
STUNTEBECK	70	PL 32B 391	P.H. Stuntebeck *et al.*	(NDAM)
ADERHOLZ	69	NP B11 259	M. Aderholz *et al.*	(AACH3, BERL, CERN+)
ANDERSON	69	PRL 22 1390	E.W. Anderson *et al.*	(BNL, CMU)
ARMENISE	68	NC 54A 999	N. Armenise *et al.*	(BARI, BGNA, FIRZ+) I
BALTAY	68	PRL 20 887	C. Baltay *et al.*	(COLU, ROCH, RUTG, YALE) I
CASO	68	NC 54A 983	C. Caso *et al.*	(GENO, HAMB, MILA, SACL)
CRENNELL	68B	PL 28B 136	D.J. Crennell *et al.*	(BNL)
JOHNSTON	68	PRL 20 1414	T.F. Johnston *et al.*	(TNTO, WISC) IJP
FOCACCI	66	PRL 17 890	M.N. Focacci *et al.*	(CERN)
GOLDBERG	65	PL 17 354	M. Goldberg *et al.*	(CERN, EPOL, ORSAY+)