

$\rho_3(1690)$ 

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

## $\rho_3(1690)$ MASS

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

### 2 $\pi$ 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 ± 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	<sup>1</sup> ANTIPOV	77	CIBS	0	25 $\pi^- p \rightarrow p3\pi$
1690 ± 7	600	<sup>1</sup> ENGLER	74	DBC	0	6 $\pi^+ n \rightarrow \pi^+ \pi^- p$
1693 ± 8		<sup>2</sup> 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		<sup>3</sup> CORDEN	79	OMEG		12–15 $\pi^- p \rightarrow n2\pi$
1692 ± 12		<sup>2,4</sup> 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 $\pi^+ p \rightarrow N2\pi$
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 $\pi^- p$

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

<sup>2</sup> Uses same data as HYAMS 75.

<sup>3</sup> From a phase shift solution containing a  $f'_2(1525)$  width two times larger than the  $K\bar{K}$  result.

<sup>4</sup> 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
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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	<sup>5,6</sup> MARTIN	78D	SPEC		10 $\pi p \rightarrow K_S^0 K^- p$
1692 ± 6		BLUM	75	ASPK	0	18.4 $\pi^- p \rightarrow nK^+ K^-$
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		<sup>7</sup> COSTA	80	OMEG		10 $\pi^- p \rightarrow K^+ K^- n$
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<sup>5</sup> From a fit to  $J^P = 3^-$  partial wave.

<sup>6</sup> Systematic error on mass scale subtracted.

<sup>7</sup> 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 $\pm$  5 OUR AVERAGE** Error includes scale factor of 1.1.

1694 $\pm$ 6		<sup>8</sup> EVANGELIS...	81	OMEG	-	12 $\pi^- p \rightarrow p4\pi$
1665 $\pm$ 15	177	BALTAY	78B	HBC	+	15 $\pi^+ p \rightarrow p4\pi$
1670 $\pm$ 10		THOMPSON	74	HBC	+	13 $\pi^+ p$
1687 $\pm$ 20		CASON	73	HBC	-	8,18.5 $\pi^- p$
1685 $\pm$ 14		<sup>9</sup> CASON	73	HBC	-	8,18.5 $\pi^- p$
1680 $\pm$ 40	144	BARTSCH	70B	HBC	+	8 $\pi^+ p \rightarrow N4\pi$
1689 $\pm$ 20	102	<sup>9</sup> BARTSCH	70B	HBC	+	8 $\pi^+ p \rightarrow N2p$
1705 $\pm$ 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 $\pm$ 10		<sup>10</sup> EVANGELIS...	81	OMEG	-	12 $\pi^- p \rightarrow p4\pi$
1673 $\pm$ 9		<sup>11</sup> EVANGELIS...	81	OMEG	-	12 $\pi^- p \rightarrow p4\pi$
1733 $\pm$ 9	66	<sup>9</sup> KLIGER	74	HBC	-	4.5 $\pi^- p \rightarrow p4\pi$
1630 $\pm$ 15		HOLMES	72	HBC	+	10-12 $K^+ p$
1720 $\pm$ 15		BALTAY	68	HBC	+	7, 8.5 $\pi^+ p$

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

<sup>9</sup> From  $\rho^\pm \rho^0$  mode.

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

<sup>11</sup> 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 $\pm$  7 OUR AVERAGE**

1670 $\pm$ 25		<sup>12</sup> ALDE	95	GAM2		38 $\pi^- p \rightarrow \omega\pi^0 n$
1690 $\pm$ 15		EVANGELIS...	81	OMEG	-	12 $\pi^- p \rightarrow \omega\pi p$
1666 $\pm$ 14		GESSAROLI	77	HBC		11 $\pi^- p \rightarrow \omega\pi p$
1686 $\pm$ 9		THOMPSON	74	HBC	+	13 $\pi^+ p$

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

1654 $\pm$ 24		BARNHAM	70	HBC	+	10 $K^+ p \rightarrow \omega\pi X$
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<sup>12</sup> 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 $\pm$  12 OUR AVERAGE**

1685 $\pm$ 10 $\pm$ 20	AMELIN	00	VES		37 $\pi^- p \rightarrow \eta\pi^+ \pi^- n$
1680 $\pm$ 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 $\pm$ 47	<sup>13</sup> ANDERSON	69	MMS	-	16 $\pi^- p$ backward
1632 $\pm$ 15	<sup>13,14</sup> FOCACCI	66	MMS	-	7-12 $\pi^- p \rightarrow pMM$

1700±15	13,14	FOCACCI	66	MMS	—	7–12 $\pi^- p \rightarrow \rho MM$
1748±15	13,14	FOCACCI	66	MMS	—	7–12 $\pi^- p \rightarrow \rho MM$

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

<sup>14</sup> Not seen by BOWEN 72.

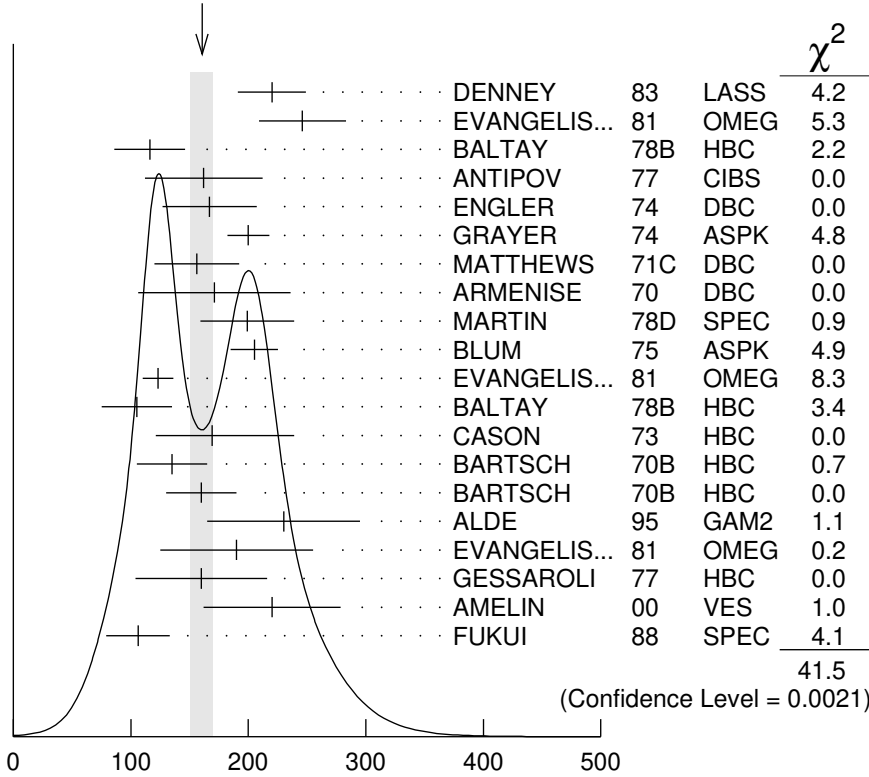
## $\rho_3(1690)$ WIDTH

### $2\pi, K\bar{K},$ 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.

WEIGHTED AVERAGE  
161±10 (Error scaled by 1.5)



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

### $2\pi$ MODE

VALUE (MeV) EVTS DOCUMENT ID TECN CHG COMMENT

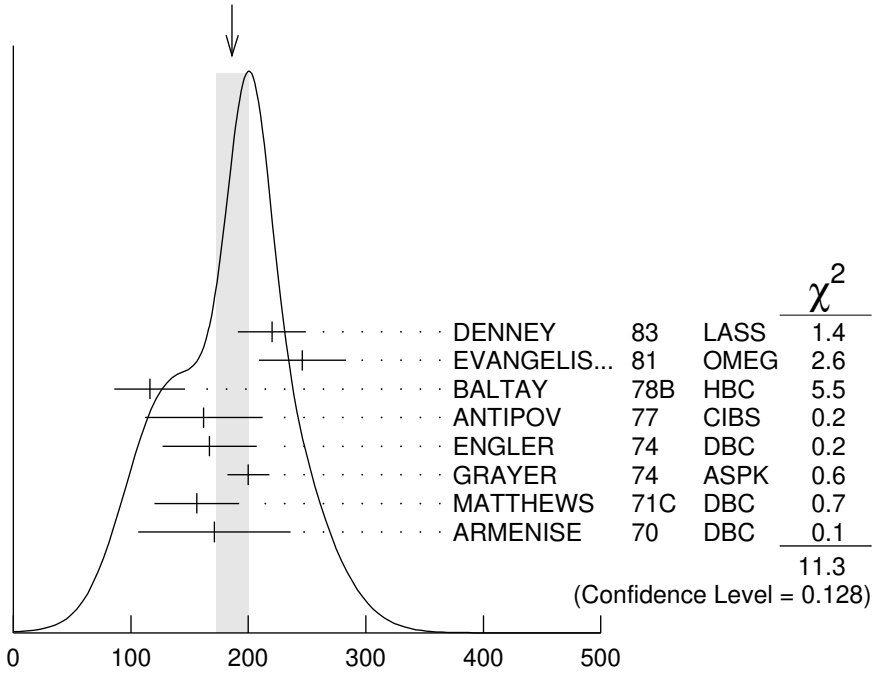
The data in this block is included in the average printed for a previous datablock.

**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	<sup>15</sup> ANTIPOV	77	CIBS	0	25 $\pi^- p \rightarrow \rho 3\pi$

167±40	600	ENGLER	74	DBC	0	6 $\pi^+ n \rightarrow \pi^+ \pi^- p$
200±18		<sup>16</sup> 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		<sup>17</sup> CORDEN	79	OMEG		12-15 $\pi^- p \rightarrow n 2\pi$
240±30		<sup>16,18</sup> ESTABROOKS	75	RVUE		17 $\pi^- p \rightarrow \pi^+ \pi^- n$
180±30	122	BARTSCH	70B	HBC	+	8 $\pi^+ p \rightarrow N 2\pi$
267 <sup>+72</sup> <sub>-46</sub>		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 $\pi^- p$

WEIGHTED AVERAGE  
186±14 (Error scaled by 1.3)



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

<sup>16</sup> Uses same data as HYAMS 75 and BECKER 79.

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

<sup>18</sup> From phase-shift analysis. Error takes account of spread of different phase-shift solutions.  $\rho_3(1690)$  width,  $2\pi$  mode (MeV)

### $K\bar{K}$ 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.

#### 204±18 OUR AVERAGE

199±40	6000	<sup>19</sup> 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	<sup>20</sup> COSTA	80	OMEG		10	$\pi^- p \rightarrow K^+ K^- n$
112 ± 60	ADERHOLZ	69	HBC	+	8	$\pi^+ p \rightarrow K \bar{K} \pi$

<sup>19</sup> From a fit to  $J^P = 3^-$  partial wave.

<sup>20</sup> They cannot distinguish between  $\rho_3(1690)$  and  $\omega_3(1670)$ .

### $(4\pi)^\pm$ 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 ± 10 OUR AVERAGE

123 ± 13		<sup>21</sup> EVANGELIS...	81	OMEG	-	12 $\pi^- p \rightarrow p 4\pi$
105 ± 30	177	BALTAY	78B	HBC	+	15 $\pi^+ p \rightarrow p 4\pi$
169 <sup>+70</sup> <sub>-48</sub>		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		<sup>22</sup> EVANGELIS...	81	OMEG	-	12 $\pi^- p \rightarrow p 4\pi$
184 ± 33		<sup>23</sup> EVANGELIS...	81	OMEG	-	12 $\pi^- p \rightarrow p 4\pi$
150	66	<sup>24</sup> KLIGER	74	HBC	-	4.5 $\pi^- p \rightarrow p 4\pi$
106 ± 25		THOMPSON	74	HBC	+	13 $\pi^+ p$
125 <sup>+83</sup> <sub>-35</sub>		<sup>24</sup> CASON	73	HBC	-	8,18.5 $\pi^- p$
130 ± 30		HOLMES	72	HBC	+	10-12 $K^+ p$
180 ± 30	90	<sup>24</sup> BARTSCH	70B	HBC	+	8 $\pi^+ p \rightarrow N a_2 \pi$
100 ± 35		BALTAY	68	HBC	+	7, 8.5 $\pi^+ p$

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

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

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

<sup>24</sup> 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 ± 40 OUR AVERAGE

230 ± 65	<sup>25</sup> ALDE	95	GAM2		38	$\pi^- p \rightarrow \omega \pi^0 n$
190 ± 65	EVANGELIS...	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 <sup>+73</sup> <sub>-43</sub>	BARNHAM	70	HBC	+	10	$K^+ p \rightarrow \omega \pi X$

<sup>25</sup> 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 ± 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	<sup>26</sup> ANDERSON	69	MMS	–	16 $\pi^- p$ backward
< 21	<sup>26,27</sup> FOCACCI	66	MMS	–	7–12 $\pi^- p \rightarrow pMM$
< 30	<sup>26,27</sup> FOCACCI	66	MMS	–	7–12 $\pi^- p \rightarrow pMM$
< 38	<sup>26,27</sup> FOCACCI	66	MMS	–	7–12 $\pi^- p \rightarrow pMM$

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

<sup>27</sup> Not seen by BOWEN 72.

 **$\rho_3(1690)$  DECAY MODES**

Mode	Fraction ( $\Gamma_i/\Gamma$ )	Scale factor
$\Gamma_1$ $4\pi$	(71.1 ± 1.9) %	
$\Gamma_2$ $\pi^\pm\pi^+\pi^-\pi^0$	(67 ± 22) %	
$\Gamma_3$ $\omega\pi$	(16 ± 6) %	
$\Gamma_4$ $\pi\pi$	(23.6 ± 1.3) %	
$\Gamma_5$ $K\bar{K}\pi$	( 3.8 ± 1.2) %	
$\Gamma_6$ $K\bar{K}$	( 1.58 ± 0.26) %	1.2
$\Gamma_7$ $\eta\pi^+\pi^-$	seen	
$\Gamma_8$ $\rho(770)\eta$	seen	
$\Gamma_9$ $\pi\pi\rho$	seen	
$\Gamma_{10}$ $a_2(1320)\pi$	seen	
$\Gamma_{11}$ $\rho\rho$	seen	
$\Gamma_{12}$ $\phi\pi$		
$\Gamma_{13}$ $\eta\pi$		
$\Gamma_{14}$ $\pi^\pm 2\pi^+ 2\pi^- \pi^0$		

**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

$\Gamma(\pi\pi)/\Gamma_{\text{total}}$   $\Gamma_4/\Gamma$

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>CHG</u>	<u>COMMENT</u>
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**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
$0.23 \pm 0.02$	CORDEN	79	OMEG		12-15 $\pi^- p \rightarrow n2\pi$
$0.22 \pm 0.04$	<sup>28</sup> MATTHEWS	71C	HDBC	0	7 $\pi^+ n \rightarrow \pi^- p$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●					
$0.245 \pm 0.006$	<sup>29</sup> ESTABROOKS	75	RVUE		17 $\pi^- p \rightarrow \pi^+ \pi^- n$

<sup>28</sup> One-pion-exchange model used in this estimation.

<sup>29</sup> From phase-shift analysis of HYAMS 75 data.

$\Gamma(\pi\pi)/\Gamma(\pi^\pm\pi^+\pi^-\pi^0)$   $\Gamma_4/\Gamma_2$

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>CHG</u>	<u>COMMENT</u>
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**0.35 ± 0.11**

● ● ● 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 $\pi^- p$

$\Gamma(\pi\pi)/\Gamma(4\pi)$   $\Gamma_4/\Gamma_1$

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>CHG</u>	<u>COMMENT</u>
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**0.332 ± 0.026 OUR FIT** Error includes scale factor of 1.1.

**0.30 ± 0.10** BALTAY 78B HBC 0 15  $\pi^+ p \rightarrow p4\pi$

$\Gamma(K\bar{K})/\Gamma(\pi\pi)$   $\Gamma_6/\Gamma_4$

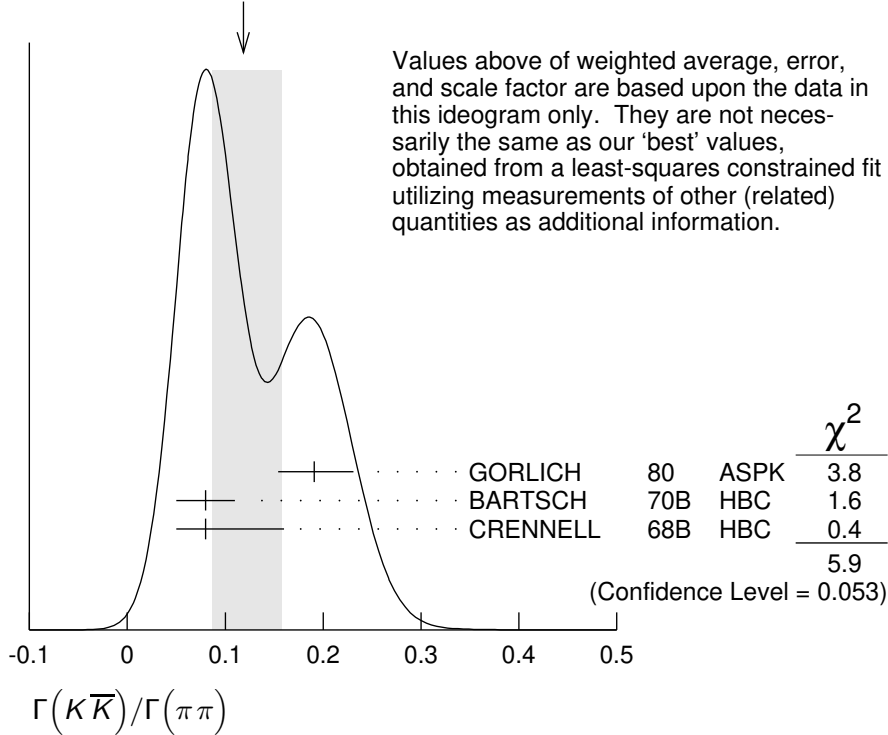
<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>CHG</u>	<u>COMMENT</u>
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**0.067 ± 0.011 OUR FIT** Error includes scale factor of 1.2.

**0.118<sup>+0.040</sup><sub>-0.032</sub> 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
$0.08 \pm 0.03$	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)



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

$\Gamma_5 / \Gamma_4$

VALUE	DOCUMENT ID	TECN	CHG	COMMENT
<b>0.16±0.05 OUR FIT</b>				
<b>0.16±0.05</b>	<sup>30</sup> BARTSCH	70B	HBC	+ 8 $\pi^+ \rho$

<sup>30</sup> 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
<b>0.94±0.09 OUR AVERAGE</b>				
0.96±0.21	BALTAY	78B	HBC	+ 15 $\pi^+ \rho \rightarrow p 4\pi$
0.88±0.15	BALLAM	71B	HBC	- 16 $\pi^- \rho$
1 ±0.15	BARTSCH	70B	HBC	+ 8 $\pi^+ \rho$
consistent with 1	CASO	68	HBC	- 11 $\pi^- \rho$

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

$\Gamma_{11} / \Gamma_2$

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 $\pi^+ \rho \rightarrow p 4\pi$
0.56	66	KLIGER	74	HBC	- 4.5 $\pi^- \rho \rightarrow p 4\pi$
0.13±0.09		<sup>31</sup> THOMPSON	74	HBC	+ 13 $\pi^+ \rho$
0.7 ±0.15		BARTSCH	70B	HBC	+ 8 $\pi^+ \rho$

<sup>31</sup>  $\rho\rho$  and  $a_2(1320)\pi$  modes are indistinguishable.



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

VALUE	DOCUMENT ID	TECN	CHG	COMMENT
0.48±0.16	CASO	68	HBC	– 11 $\pi^- p$

$$\frac{\Gamma(a_2(1320)\pi)/\Gamma(\pi^\pm\pi^+\pi^-\pi^0)}{\Gamma_{10}/\Gamma_2}$$

VALUE	DOCUMENT ID	TECN	CHG	COMMENT
0.66±0.08	BALTAY	78B	HBC	+ 15 $\pi^+ p \rightarrow p4\pi$
0.36±0.14	<sup>32</sup> 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 $\pi^+ p$

<sup>32</sup>  $\rho\rho$  and  $a_2(1320)\pi$  modes are indistinguishable.

$$\frac{\Gamma(\omega\pi)/\Gamma(\pi^\pm\pi^+\pi^-\pi^0)}{\Gamma_3/\Gamma_2}$$

VALUE	CL%	DOCUMENT ID	TECN	CHG	COMMENT
<b>0.23±0.05 OUR AVERAGE</b>		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 $\pi^- p$
<0.11	95	BALTAY	78B	HBC	+ 15 $\pi^+ p \rightarrow p4\pi$
<0.09		KLIGER	74	HBC	– 4.5 $\pi^- p \rightarrow p4\pi$

$$\frac{\Gamma(\phi\pi)/\Gamma(\pi^\pm\pi^+\pi^-\pi^0)}{\Gamma_{12}/\Gamma_2}$$

VALUE	DOCUMENT ID	TECN	CHG	COMMENT
<0.11	BALTAY	68	HBC	+ 7,8.5 $\pi^+ p$

$$\frac{\Gamma(\pi^\pm 2\pi^+ 2\pi^- \pi^0)/\Gamma(\pi^\pm\pi^+\pi^-\pi^0)}{\Gamma_{14}/\Gamma_2}$$

VALUE	DOCUMENT ID	TECN	CHG	COMMENT
<0.15	BALTAY	68	HBC	+ 7,8.5 $\pi^+ p$

$$\frac{\Gamma(\eta\pi)/\Gamma(\pi^\pm\pi^+\pi^-\pi^0)}{\Gamma_{13}/\Gamma_2}$$

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

$$\frac{\Gamma(K\bar{K})/\Gamma_{\text{total}}}{\Gamma_6/\Gamma}$$

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

<sup>33</sup> 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
$0.22 \pm 0.08$	CASON 73 HBC - 8,18.5 $\pi^- p$

$\Gamma(\eta\pi^+\pi^-)/\Gamma_{\text{total}}$	$\Gamma_7/\Gamma$
VALUE	DOCUMENT ID TECN COMMENT
<b>seen</b>	FUKUI 88 SPEC 8.95 $\pi^- p \rightarrow \eta\pi^+\pi^- n$

$\Gamma(a_2(1320)\pi)/\Gamma(\rho(770)\eta)$	$\Gamma_{10}/\Gamma_8$
VALUE	DOCUMENT ID TECN COMMENT
<b>5.5 <math>\pm</math> 2.0</b>	AMELIN 00 VES 37 $\pi^- p \rightarrow \eta\pi^+\pi^- n$

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