

# $\rho(1700)$

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

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## $\rho(1700)$ MASS

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

VALUE (MeV)	DOCUMENT ID
<b>1720±20 OUR ESTIMATE</b>	

### $\eta\rho^0$ 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	$e^+e^- \rightarrow \eta\pi^+\pi^-$
1701±15	<sup>1</sup> FUKUI	88	SPEC	$8.95 \pi^- p \rightarrow \eta\pi^+\pi^- n$

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

### $\pi\pi$ MODE

VALUE (MeV)	EVTS	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. • • •

1728 ±17 ±89	5.4M	2,3	FUJIKAWA	08	BELL	$\tau^- \rightarrow \pi^- \pi^0 \nu_\tau$
1780 <sup>+37</sup> <sub>-29</sub>		4	ABELE	97	CBAR	$\bar{p} n \rightarrow \pi^- \pi^0 \pi^0$
1719 ±15		4	BERTIN	97C	OBLX	$0.0 \bar{p} p \rightarrow \pi^+ \pi^- \pi^0$
1730 ±30			CLEGG	94	RVUE	$e^+e^- \rightarrow \pi^+ \pi^-$
1768 ±21			BISELLO	89	DM2	$e^+e^- \rightarrow \pi^+ \pi^-$
1745.7±91.9			DUBNICKA	89	RVUE	$e^+e^- \rightarrow \pi^+ \pi^-$
1546 ±26			GESHKEN...	89	RVUE	
1650		5	ERKAL	85	RVUE	$20-70 \gamma p \rightarrow \gamma \pi$
1550 ±70			ABE	84B	HYBR	$20 \gamma p \rightarrow \pi^+ \pi^- p$
1590 ±20		6	ASTON	80	OMEG	$20-70 \gamma p \rightarrow p 2\pi$
1600 ±10		7	ATIYA	79B	SPEC	$50 \gamma C \rightarrow C 2\pi$
1598 <sup>+24</sup> <sub>-22</sub>			BECKER	79	ASPK	$17 \pi^- p$ polarized
1659 ±25		5	LANG	79	RVUE	
1575		5	MARTIN	78C	RVUE	$17 \pi^- p \rightarrow \pi^+ \pi^- n$
1610 ±30		5	FROGGATT	77	RVUE	$17 \pi^- p \rightarrow \pi^+ \pi^- n$
1590 ±20		8	HYAMS	73	ASPK	$17 \pi^- p \rightarrow \pi^+ \pi^- n$

<sup>2</sup>  $|F_\pi(0)|^2$  fixed to 1.

<sup>3</sup> From the GOUNARIS 68 parametrization of the pion form factor.

<sup>4</sup> T-matrix pole.

<sup>5</sup> From phase shift analysis of HYAMS 73 data.

<sup>6</sup> Simple relativistic Breit-Wigner fit with constant width.

<sup>7</sup> An additional 40 MeV uncertainty in both the mass and width is present due to the choice of the background shape.

<sup>8</sup> Included in BECKER 79 analysis.

## $\pi\omega$ MODE

VALUE (MeV)	DOCUMENT ID	TECN	COMMENT
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
1550 to 1620	<sup>9</sup> ACHASOV	00I SND	$e^+e^- \rightarrow \pi^0\pi^0\gamma$
1580 to 1710	<sup>10</sup> ACHASOV	00I SND	$e^+e^- \rightarrow \pi^0\pi^0\gamma$
1710±90	ACHASOV	97 RVUE	$e^+e^- \rightarrow \omega\pi^0$

<sup>9</sup>Taking into account both  $\rho(1450)$  and  $\rho(1700)$  contributions. Using the data of ACHASOV 00I on  $e^+e^- \rightarrow \omega\pi^0$  and of EDWARDS 00A on  $\tau^- \rightarrow \omega\pi^-\nu_\tau$ .  $\rho(1450)$  mass and width fixed at 1400 MeV and 500 MeV respectively.

<sup>10</sup>Taking into account the  $\rho(1700)$  contribution only. Using the data of ACHASOV 00I on  $e^+e^- \rightarrow \omega\pi^0$  and of EDWARDS 00A on  $\tau^- \rightarrow \omega\pi^-\nu_\tau$ .

## $K\bar{K}$ 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	<sup>11</sup> ABELE	99D CBAR	±	0.0 $\bar{p}p \rightarrow K^+K^-\pi^0$
1582 ±36	1600	CLELAND	82B SPEC	±	50 $\pi p \rightarrow K_S^0 K^\pm p$

<sup>11</sup>K-matrix pole. Isospin not determined, could be  $\omega(1650)$  or  $\phi(1680)$ .

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

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●				
1851 <sup>+27</sup> <sub>-24</sub>		ACHASOV	97 RVUE	$e^+e^- \rightarrow 2(\pi^+\pi^-)$
1570±20		<sup>12</sup> CORDIER	82 DM1	$e^+e^- \rightarrow 2(\pi^+\pi^-)$
1520±30		<sup>13</sup> ASTON	81E OMEG	20-70 $\gamma p \rightarrow p4\pi$
1654±25		<sup>14</sup> DIBIANCA	81 DBC	$\pi^+d \rightarrow pp2(\pi^+\pi^-)$
1666±39		<sup>12</sup> BACCI	80 FRAG	$e^+e^- \rightarrow 2(\pi^+\pi^-)$
1780	34	KILLIAN	80 SPEC	11 $e^-p \rightarrow 2(\pi^+\pi^-)$
1500		<sup>15</sup> ATIYA	79B SPEC	50 $\gamma C \rightarrow C4\pi^\pm$
1570±60	65	<sup>16</sup> ALEXANDER	75 HBC	7.5 $\gamma p \rightarrow p4\pi$
1550±60		<sup>13</sup> CONVERSI	74 OSPK	$e^+e^- \rightarrow 2(\pi^+\pi^-)$
1550±50	160	SCHACHT	74 STRC	5.5-9 $\gamma p \rightarrow p4\pi$
1450±100	340	SCHACHT	74 STRC	9-18 $\gamma p \rightarrow p4\pi$
1430±50	400	BINGHAM	72B HBC	9.3 $\gamma p \rightarrow p4\pi$

<sup>12</sup>Simple relativistic Breit-Wigner fit with model dependent width.

<sup>13</sup>Simple relativistic Breit-Wigner fit with constant width.

<sup>14</sup>One peak fit result.

<sup>15</sup>Parameters roughly estimated, not from a fit.

<sup>16</sup>Skew mass distribution compensated by Ross-Stodolsky factor.

## $\pi^+\pi^-\pi^0\pi^0$ 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 $\gamma p$

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

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

$1730 \pm 34$	<sup>17</sup> FRABETTI	04	E687	$\gamma p \rightarrow 3\pi^+ 3\pi^- p$
$1783 \pm 15$	CLEGG	90	RVUE	$e^+ e^- \rightarrow 3(\pi^+\pi^-)2(\pi^+\pi^-\pi^0)$

<sup>17</sup> From a fit with two resonances with the JACOB 72 continuum.

### $\rho(1700)$ WIDTH

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

<u>VALUE (MeV)</u>	<u>DOCUMENT ID</u>
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**250 ± 100 OUR ESTIMATE**

#### $\eta\rho^0$ MODE

<u>VALUE (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
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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. • • •

$150 \pm 30$	ANTONELLI	88	DM2	$e^+ e^- \rightarrow \eta\pi^+\pi^-$
$282 \pm 44$	<sup>18</sup> FUKUI	88	SPEC	$8.95 \pi^- p \rightarrow \eta\pi^+\pi^- n$

<sup>18</sup> Assuming  $\rho^+ f_0(1370)$  decay mode interferes with  $a_1(1260)^+ \pi$  background. From a two Breit-Wigner fit.

#### $\pi\pi$ MODE

<u>VALUE (MeV)</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
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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. • • •

$164 \pm 21$	$\frac{+89}{-26}$	5.4M	<sup>19,20</sup> FUJIKAWA	08	BELL	$\tau^- \rightarrow \pi^- \pi^0 \nu_\tau$
$275 \pm 45$			<sup>21</sup> ABELE	97	CBAR	$\bar{p} n \rightarrow \pi^- \pi^0 \pi^0$
$310 \pm 40$			<sup>21</sup> BERTIN	97C	OBLX	$0.0 \bar{p} p \rightarrow \pi^+ \pi^- \pi^0$
$400 \pm 100$			CLEGG	94	RVUE	$e^+ e^- \rightarrow \pi^+ \pi^-$
$224 \pm 22$			BISELLO	89	DM2	$e^+ e^- \rightarrow \pi^+ \pi^-$
$242.5 \pm 163.0$			DUBNICKA	89	RVUE	$e^+ e^- \rightarrow \pi^+ \pi^-$
$620 \pm 60$			GESHKEN...	89	RVUE	
$< 315$			<sup>22</sup> ERKAL	85	RVUE	$20-70 \gamma p \rightarrow \gamma \pi$
$280 \pm 30$	$-80$		ABE	84B	HYBR	$20 \gamma p \rightarrow \pi^+ \pi^- p$
$230 \pm 80$			<sup>23</sup> ASTON	80	OMEG	$20-70 \gamma p \rightarrow p 2\pi$
$283 \pm 14$			<sup>24</sup> ATIYA	79B	SPEC	$50 \gamma C \rightarrow C 2\pi$
$175 \pm 98$	$-53$		BECKER	79	ASPK	$17 \pi^- p$ polarized
$232 \pm 34$			<sup>22</sup> LANG	79	RVUE	
$340$			<sup>22</sup> MARTIN	78C	RVUE	$17 \pi^- p \rightarrow \pi^+ \pi^- n$
$300 \pm 100$			<sup>22</sup> FROGGATT	77	RVUE	$17 \pi^- p \rightarrow \pi^+ \pi^- n$
$180 \pm 50$			<sup>25</sup> HYAMS	73	ASPK	$17 \pi^- p \rightarrow \pi^+ \pi^- n$

<sup>19</sup>  $|F_\pi(0)|^2$  fixed to 1.

<sup>20</sup> From the GOUNARIS 68 parametrization of the pion form factor.

<sup>21</sup> T-matrix pole.

<sup>22</sup> From phase shift analysis of HYAMS 73 data.

<sup>23</sup> Simple relativistic Breit-Wigner fit with constant width.

<sup>24</sup> An additional 40 MeV uncertainty in both the mass and width is present due to the choice of the background shape.

<sup>25</sup> Included in BECKER 79 analysis.

## **$K\bar{K}$ MODE**

<u>VALUE (MeV)</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>CHG</u>	<u>COMMENT</u>
• • • We do not use the following data for averages, fits, limits, etc. • • •					
187.2 ± 26.7	27k	<sup>26</sup> ABELE	99D	CBAR ±	0.0 $\bar{p}p \rightarrow K^+ K^- \pi^0$
265 ± 120	1600	CLELAND	82B	SPEC ±	50 $\pi p \rightarrow K_S^0 K^\pm p$

<sup>26</sup> K-matrix pole. Isospin not determined, could be  $\omega(1650)$  or  $\phi(1680)$ .

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

<u>VALUE (MeV)</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
• • • We do not use the following data for averages, fits, limits, etc. • • •				
510 ± 40		<sup>27</sup> CORDIER	82	DM1 $e^+ e^- \rightarrow 2(\pi^+ \pi^-)$
400 ± 50		<sup>28</sup> ASTON	81E	OMEG 20–70 $\gamma p \rightarrow p 4\pi$
400 ± 146		<sup>29</sup> DIBIANCA	81	DBC $\pi^+ d \rightarrow p p 2(\pi^+ \pi^-)$
700 ± 160		<sup>27</sup> BACCI	80	FRAG $e^+ e^- \rightarrow 2(\pi^+ \pi^-)$
100	34	KILLIAN	80	SPEC 11 $e^- p \rightarrow 2(\pi^+ \pi^-)$
600		<sup>30</sup> ATIYA	79B	SPEC 50 $\gamma C \rightarrow C 4\pi^\pm$
340 ± 160	65	<sup>31</sup> ALEXANDER	75	HBC 7.5 $\gamma p \rightarrow p 4\pi$
360 ± 100		<sup>28</sup> CONVERSI	74	OSPK $e^+ e^- \rightarrow 2(\pi^+ \pi^-)$
400 ± 120	160	<sup>32</sup> SCHACHT	74	STRC 5.5–9 $\gamma p \rightarrow p 4\pi$
850 ± 200	340	<sup>32</sup> SCHACHT	74	STRC 9–18 $\gamma p \rightarrow p 4\pi$
650 ± 100	400	BINGHAM	72B	HBC 9.3 $\gamma p \rightarrow p 4\pi$

<sup>27</sup> Simple relativistic Breit-Wigner fit with model-dependent width.

<sup>28</sup> Simple relativistic Breit-Wigner fit with constant width.

<sup>29</sup> One peak fit result.

<sup>30</sup> Parameters roughly estimated, not from a fit.

<sup>31</sup> Skew mass distribution compensated by Ross-Stodolsky factor.

<sup>32</sup> Width errors enlarged by us to  $4\Gamma/\sqrt{N}$ ; see the note with the  $K^*(892)$  mass.

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

<u>VALUE (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
• • • We do not use the following data for averages, fits, limits, etc. • • •			
300 ± 50	ATKINSON	85B	OMEG 20–70 $\gamma p$

## $\omega\pi^0$ MODE

VALUE (MeV)	DOCUMENT ID	TECN	COMMENT
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
350 to 580	<sup>33</sup> ACHASOV	00i	SND $e^+e^- \rightarrow \pi^0\pi^0\gamma$
490 to 1040	<sup>34</sup> ACHASOV	00i	SND $e^+e^- \rightarrow \pi^0\pi^0\gamma$
<sup>33</sup> Taking into account both $\rho(1450)$ and $\rho(1700)$ contributions. Using the data of ACHASOV 00i on $e^+e^- \rightarrow \omega\pi^0$ and of EDWARDS 00A on $\tau^- \rightarrow \omega\pi^-\nu_\tau$ . $\rho(1450)$ mass and width fixed at 1400 MeV and 500 MeV respectively.			
<sup>34</sup> Taking into account the $\rho(1700)$ contribution only. Using the data of ACHASOV 00i on $e^+e^- \rightarrow \omega\pi^0$ and of EDWARDS 00A on $\tau^- \rightarrow \omega\pi^-\nu_\tau$ .			

## $3(\pi^+\pi^-)$ 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. ● ● ●			
$315 \pm 100$	<sup>35</sup> FRABETTI	04	E687 $\gamma p \rightarrow 3\pi^+3\pi^-p$
$285 \pm 20$	CLEGG	90	RVUE $e^+e^- \rightarrow 3(\pi^+\pi^-)2(\pi^+\pi^-\pi^0)$
<sup>35</sup> From a fit with two resonances with the JACOB 72 continuum.			

## $\rho(1700)$ DECAY MODES

Mode	Fraction ( $\Gamma_i/\Gamma$ )
$\Gamma_1$ $4\pi$	
$\Gamma_2$ $2(\pi^+\pi^-)$	large
$\Gamma_3$ $\rho\pi\pi$	dominant
$\Gamma_4$ $\rho^0\pi^+\pi^-$	large
$\Gamma_5$ $\rho^0\pi^0\pi^0$	
$\Gamma_6$ $\rho^\pm\pi^\mp\pi^0$	large
$\Gamma_7$ $a_1(1260)\pi$	seen
$\Gamma_8$ $h_1(1170)\pi$	seen
$\Gamma_9$ $\pi(1300)\pi$	seen
$\Gamma_{10}$ $\rho\rho$	seen
$\Gamma_{11}$ $\pi^+\pi^-$	seen
$\Gamma_{12}$ $\pi\pi$	seen
$\Gamma_{13}$ $K\bar{K}^*(892) + c.c.$	seen
$\Gamma_{14}$ $\eta\rho$	seen
$\Gamma_{15}$ $a_2(1320)\pi$	not seen
$\Gamma_{16}$ $K\bar{K}$	seen
$\Gamma_{17}$ $e^+e^-$	seen
$\Gamma_{18}$ $\pi^0\omega$	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<sub>i</sub> in  $e^+e^-$  annihilation.

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

<u>VALUE (keV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
2.6 ± 0.2	DEL COURT	81B DM1	$e^+e^- \rightarrow 2(\pi^+\pi^-)$
2.83 ± 0.42	BACCI	80 FRAG	$e^+e^- \rightarrow 2(\pi^+\pi^-)$

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

<u>VALUE (keV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
0.13	<sup>36</sup> DIEKMAN	88 RVUE	$e^+e^- \rightarrow \pi^+\pi^-$
0.029 <sup>+0.016</sup> <sub>-0.012</sub>	KURDADZE	83 OLYA	0.64–1.4 $e^+e^- \rightarrow \pi^+\pi^-$

<sup>36</sup> Using total width = 220 MeV.

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

<u>VALUE (keV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
0.305 ± 0.071	<sup>37</sup> BIZOT	80 DM1	$e^+e^-$

<sup>37</sup> Model dependent.

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

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

### $\Gamma(K\bar{K}) \times \Gamma(e^+e^-)/\Gamma_{\text{total}} \qquad \Gamma_{16}\Gamma_{17}/\Gamma$

<u>VALUE (keV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
0.035 ± 0.029	<sup>38</sup> BIZOT	80 DM1	$e^+e^-$

<sup>38</sup> Model dependent.

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

<u>VALUE (keV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
3.510 ± 0.090	<sup>39</sup> BIZOT	80 DM1	$e^+e^-$

<sup>39</sup> Model dependent.

## $\rho(1700)$ BRANCHING RATIOS

### $\Gamma(\rho\pi\pi)/\Gamma(4\pi)$ $\Gamma_3/\Gamma_1$

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
$0.28 \pm 0.06$	<sup>40</sup> ABELE	01B CBAR	$0.0 \bar{p}n \rightarrow 5\pi$
<sup>40</sup> $\omega\pi$ not included.			

### $\Gamma(\rho^0\pi^+\pi^-)/\Gamma(2(\pi^+\pi^-))$ $\Gamma_4/\Gamma_2$

<u>VALUE</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●				
$\sim 1.0$		DELCOURT	81B DM1	$e^+e^- \rightarrow 2(\pi^+\pi^-)$
$0.7 \pm 0.1$	500	SCHACHT	74 STRC	$5.5-18 \gamma p \rightarrow p4\pi$
0.80		<sup>41</sup> BINGHAM	72B HBC	$9.3 \gamma p \rightarrow p4\pi$
<sup>41</sup> The $\pi\pi$ system is in $S$ -wave.				

### $\Gamma(\rho^0\pi^0\pi^0)/\Gamma(\rho^\pm\pi^\mp\pi^0)$ $\Gamma_5/\Gamma_6$

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>CHG</u>	<u>COMMENT</u>
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●				
$< 0.10$	ATKINSON	85B OMEG		$20-70 \gamma p$
$< 0.15$	ATKINSON	82 OMEG 0		$20-70 \gamma p \rightarrow p4\pi$

### $\Gamma(a_1(1260)\pi)/\Gamma(4\pi)$ $\Gamma_7/\Gamma_1$

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
$0.16 \pm 0.05$	<sup>42</sup> ABELE	01B CBAR	$0.0 \bar{p}n \rightarrow 5\pi$
<sup>42</sup> $\omega\pi$ not included.			

### $\Gamma(h_1(1170)\pi)/\Gamma(4\pi)$ $\Gamma_8/\Gamma_1$

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
$0.17 \pm 0.06$	<sup>43</sup> ABELE	01B CBAR	$0.0 \bar{p}n \rightarrow 5\pi$
<sup>43</sup> $\omega\pi$ not included.			

### $\Gamma(\pi(1300)\pi)/\Gamma(4\pi)$ $\Gamma_9/\Gamma_1$

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
$0.30 \pm 0.10$	<sup>44</sup> ABELE	01B CBAR	$0.0 \bar{p}n \rightarrow 5\pi$
<sup>44</sup> $\omega\pi$ not included.			

### $\Gamma(\rho\rho)/\Gamma(4\pi)$ $\Gamma_{10}/\Gamma_1$

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
$0.09 \pm 0.03$	<sup>45</sup> ABELE	01B CBAR	$0.0 \bar{p}n \rightarrow 5\pi$
<sup>45</sup> $\omega\pi$ not included.			

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

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
● ● ● 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	<sup>46</sup> MARTIN	78C	RVUE 17 $\pi^- p \rightarrow \pi^+\pi^- n$
<0.20	<sup>47</sup> COSTA...	77B	RVUE $e^+e^- \rightarrow 2\pi, 4\pi$
$0.30 \pm 0.05$	<sup>46</sup> FROGGATT	77	RVUE 17 $\pi^- p \rightarrow \pi^+\pi^- n$
<0.15	<sup>48</sup> EISENBERG	73	HBC 5 $\pi^+ p \rightarrow \Delta^{++} 2\pi$
$0.25 \pm 0.05$	<sup>49</sup> HYAMS	73	ASPK 17 $\pi^- p \rightarrow \pi^+\pi^- n$

<sup>46</sup> From phase shift analysis of HYAMS 73 data.

<sup>47</sup> Estimate using unitarity, time reversal invariance, Breit-Wigner.

<sup>48</sup> Estimated using one-pion-exchange model.

<sup>49</sup> Included in BECKER 79 analysis.

$\Gamma(\pi^+\pi^-)/\Gamma(2(\pi^+\pi^-))$   $\Gamma_{11}/\Gamma_2$

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
$0.13 \pm 0.05$	ASTON	80	OMEG 20-70 $\gamma p \rightarrow p 2\pi$
<0.14	<sup>50</sup> DAVIER	73	STRC 6-18 $\gamma p \rightarrow p 4\pi$
<0.2	<sup>51</sup> BINGHAM	72B	HBC 9.3 $\gamma p \rightarrow p 2\pi$

<sup>50</sup> Upper limit is estimate.

<sup>51</sup>  $2\sigma$  upper limit.

$\Gamma(\pi\pi)/\Gamma(4\pi)$   $\Gamma_{12}/\Gamma_1$

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
$0.16 \pm 0.04$	<sup>52,53</sup> ABELE	01B	CBAR 0.0 $\bar{p} n \rightarrow 5\pi$

<sup>52</sup> Using ABELE 97.

<sup>53</sup>  $\omega\pi$  not included.

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

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

$\Gamma(K\bar{K}^*(892)+\text{c.c.})/\Gamma(2(\pi^+\pi^-))$   $\Gamma_{13}/\Gamma_2$

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
$0.15 \pm 0.03$	<sup>54</sup> DELCOURT	81B	DM1 $e^+e^- \rightarrow \bar{K} K \pi$

<sup>54</sup> Assuming  $\rho(1700)$  and  $\omega$  radial excitations to be degenerate in mass.

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

<u>VALUE</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
● ● ● 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 20-70	$\gamma p$



$\Gamma(\eta\rho)/\Gamma(2(\pi^+\pi^-))$   $\Gamma_{14}/\Gamma_2$

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

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

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
• • • We do not use the following data for averages, fits, limits, etc. • • •			
2.6±0.4	<sup>55</sup> BALLAM 74	HBC	9.3 $\gamma p$
<sup>55</sup> Upper limit. Background not subtracted.			

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

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

$\Gamma(K\bar{K})/\Gamma(2(\pi^+\pi^-))$   $\Gamma_{16}/\Gamma_2$

<u>VALUE</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>CHG</u>	<u>COMMENT</u>
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.015±0.010		<sup>56</sup> DELCOURT 81B	DM1		$e^+e^- \rightarrow \bar{K}K$
<0.04	95	BINGHAM 72B	HBC	0	9.3 $\gamma p$
<sup>56</sup> Assuming $\rho(1700)$ and $\omega$ radial excitations to be degenerate in mass.					

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

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
• • • We do not use the following data for averages, fits, limits, etc. • • •			
0.052±0.026	BUON 82	DM1	$e^+e^- \rightarrow \text{hadrons}$

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

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

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ABE	84B	PRL 53 751	K. Abe <i>et al.</i>	
KURDADZE	83	JETPL 37 733	L.M. Kurdadze <i>et al.</i>	(NOVO)
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		Also		
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BECKER	79	NP B151 46	H. Becker <i>et al.</i>	(MPIM, CERN, ZEEM, CRAC)
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MARTIN	78C	ANP 114 1	A.D. Martin, M.R. Pennington	(CERN)
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