ho(145

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

See our mini-review under the  $\rho(1700)$ .

## ρ(1450) MASS

DOCUMENT ID

**1465±25 OUR ESTIMATE** This is only an educated guess; the error given is larger than the error on the average of the published values.

## $\eta \rho^0$ MODE

VALUE (MeV)	DOCUMENT ID	TECN COMMENT	
• • • We do not use the follo	wing data for averages,	s, fits, limits, etc. • • •	
$1497 \pm 14$	<sup>1</sup> AKHMETSHIN 01B	3 CMD2 $e^+e^- \rightarrow \eta \gamma$	
$1421 \pm 15$	<sup>2</sup> AKHMETSHIN 00D	$ m CMD2~e^+e^-  ightarrow~\eta\pi^+\pi^-$	
$1470 \pm 20$	ANTONELLI 88	DM2 $e^+e^- \rightarrow \eta \pi^+\pi^-$	
$1446 \pm 10$	FUKUI 88	SPEC 8.95 $\pi^- p \rightarrow \eta \pi^+ \pi^- n$	
-			

<sup>1</sup>Using the data of AKHMETSHIN 01B on  $e^+e^- \rightarrow \eta\gamma$ , AKHMETSHIN 00D and ANTONELLI 88 on  $e^+e^- \rightarrow \eta \pi^+\pi^-$ .

<sup>2</sup> Using the data of ANTONELLI 88, DOLINSKY 91, and AKHMETSHIN 00D. The energyindependent width of the  $\rho(1450)$  and  $\rho(1700)$  mesons assumed.

#### $\omega\pi$ MODE

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	COMMENT
• • • We do not use the	ne following	data for averages	, fits,	limits, e	tc. ● ● ●
$1582\!\pm\!17\!\pm\!25$	2382	<sup>3</sup> AKHMETSHIN	<b>03</b> B	CMD2	$e^+e \rightarrow \pi^0 \pi^0 \gamma$
$1349 \pm 25 {+10 \atop -5}$	341	<sup>4</sup> ALEXANDER	<b>01</b> B	CLE2	$B \rightarrow D^{(*)} \omega \pi^{-}$
1523±10		<sup>5</sup> EDWARDS	00A	CLE2	$\tau^- \rightarrow \omega \pi^- \nu_{\tau}$
$1463 \pm 25$		<sup>6</sup> CLEGG	94	RVUE	
1250		<sup>7</sup> ASTON	80C	OMEG	20–70 $\gamma p \rightarrow \omega \pi^0 p$
$1290 \pm 40$		<sup>7</sup> BARBER	80C	SPEC	3–5 $\gamma p \rightarrow \omega \pi^0 p$
_					_

<sup>3</sup> Using the data of AKHMETSHIN 03B and BISELLO 91B assuming the  $\omega \pi^0$  and  $\pi^+ \pi^-$  mass dependence of the total width.  $\rho(1700)$  mass and width fixed at 1700 MeV and 240 MeV, respectively.

<sup>4</sup> Using Breit-Wigner parameterization of the ho(1450) and assuming the  $\omega \pi^-$  mass dependence for the total width.

<sup>5</sup> Mass-independent width parameterization.  $\rho(1700)$  mass and width fixed at 1700 MeV and 235 MeV respectively.

<sup>6</sup> Using data from BISELLO 91B, DOLINSKY 86 and ALBRECHT 87L. <sup>7</sup> Not separated from  $b_1(1235)$ , not pure  $J^P = 1^-$  effect.

#### $4\pi$ MODE

VALUE (MeV)	DOCUMENT ID		TECN	COMMENT				
$\bullet \bullet \bullet$ We do not use the follow	ving data for aver	ages,	fits, limi	ts, etc. ● ● ●				
1435±40	ABELE	<b>01</b> B	CBAR	$0.0 \ \overline{p} n \rightarrow 2\pi^{-} 2\pi^{0} \pi^{+}$				
$1350 \pm 50$	ACHASOV	97	RVUE	$e^+e^-  ightarrow 2(\pi^+\pi^-)$				
1449± 4	<sup>8</sup> ARMSTRONG	89E	OMEG	$300 pp \rightarrow pp2(\pi^+\pi^-)$				
8 Net clear whether this charaction has $l = 1 \text{ and } 0$								

Not clear whether this observation has I=1 or 0.

HTTP://PDG.LBL.GOV	Page 1
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DDE					
1eV)	EVTS	DOCUMENT ID		TECN	COMMENT
/e do not	use the follo	owing data for a	verag	es, fits, l	limits, etc. • • •
$\pm 15$	9	SCHAEL	<b>0</b> 5C	ALEP	$\tau^- \rightarrow \pi^- \pi^0 \nu_{\tau}$
$\pm 15$	87k <sup>10,11</sup>	ANDERSON	00A	CLE2	$\tau^- \rightarrow \pi^- \pi^0 \nu_{\tau}$
	12	ABELE	<b>99</b> C	CBAR	$0.0 \ \overline{p} d \rightarrow \pi^+ \pi^- \pi^- p$
$\pm 33$		BERTIN	98	OBLX	$0.05-0.405 \ \overline{n}p \rightarrow \pi^+\pi^+\pi^-$
$\pm 14$	13	ABELE	97	CBAR	$\overline{p}n \rightarrow \pi^{-}\pi^{0}\pi^{0}$
$^{+90}_{-70}$		ACHASOV	97	RVUE	$e^+e^- \rightarrow \pi^+\pi^-$
$\pm 40$	11	BERTIN	<b>97</b> C	OBLX	$0.0 \ \overline{\rho} \rho \rightarrow \pi^+ \pi^- \pi^0$
$\pm 37$		BERTIN	<b>97</b> D	OBLX	$0.05 \ \overline{p} p \rightarrow 2\pi^+ 2\pi^-$
$\pm 25$		BISELLO	89	DM2	$e^+e^- \rightarrow \pi^+\pi^-$
$5 \pm 75.3$		DUBNICKA	89	RVUE	$e^+e^- \rightarrow \pi^+\pi^-$
$\pm 17$	14	KURDADZE	83	OLYA	0.64–1.4 $e^+e^- \rightarrow \pi^+\pi^-$
	DE heV $\pm 15$ $\pm 15$ $\pm 15$ $\pm 33$ $\pm 14$ +90 -70 $\pm 40$ $\pm 37$ $\pm 25$ $5\pm 75.3$ $\pm 17$	$\begin{array}{c c} \textbf{DE} \\ \hline \textbf{heV} & \underline{EVTS} \\ \hline \ \textbf{/e} \text{ do not use the follow} \\ \pm 15 & 9 \\ \pm 15 & 87 \\ 10,11 \\ 12 \\ \pm 33 \\ \pm 14 & 13 \\ \pm 90 \\ -70 \\ \pm 40 & 11 \\ \pm 37 \\ \pm 25 \\ 5 \pm 75.3 \\ \pm 17 & 14 \end{array}$	$\begin{array}{c c} \textbf{DE} \\ \hline \textbf{MeV} & \underline{EVTS} & \underline{DOCUMENT \ ID} \\ \hline \textbf{/e} \ do \ not \ use \ the \ following \ data \ for \ a \\ \pm 15 & 9 \ SCHAEL \\ \pm 15 & 87k & 10,11 \ ANDERSON \\ & 12 \ ABELE \\ \pm 33 & BERTIN \\ \pm 14 & 13 \ ABELE \\ \pm 90 & ACHASOV \\ \pm 40 & 11 \ BERTIN \\ \pm 37 & BERTIN \\ \pm 25 & BISELLO \\ 5 \pm 75.3 & DUBNICKA \\ \pm 17 & 14 \ KURDADZE \end{array}$	$\begin{array}{c c c c c c c c c c c c c c c c c c c $	$\begin{array}{c c c c c c c c c c c c c c c c c c c $

<sup>9</sup> From the combined fit of the  $\tau^-$  data from ANDERSON 00A and SCHAEL 05C and  $e^+e^-$  data from the compilation of BARKOV 85, AKHMETSHIN 04, and ALOISIO 05.  $\rho(1700)$  mass and width fixed at 1713 MeV and 235 MeV, respectively. Supersedes BARATE 97M.

<sup>10</sup> From the GOUNARIS 68 parametrization of the pion form factor.

 $^{11}\,\rho(1700)$  mass and width fixed at 1700 MeV and 235 MeV, respectively.

 $^{12}
ho$ (1700) mass and width fixed at 1780 MeV and 275 MeV respectively.

<sup>13</sup>T-matrix pole.

 $^{14}$  Using for ho(1700) mass and width 1600  $\pm$  20 and 300  $\pm$  10 MeV respectively.

## KK MODE

VALUE (MeV)	EVTS	DOCUMENT	ID	TECN	CHG	COMMENT	
• • • We do r	not use the fol	lowing data fo	r average	s, fits, l	imits, e	etc. • • •	
$1422.8 \pm 6.5$	27k	<sup>15</sup> ABELE	<b>99</b> D	CBAR	±	$0.0 \ \overline{p} p \rightarrow$	${\cal K}^+ {\cal K}^- \pi^0$
$^{15}$ K-matrix pole. Isospin not determined, could be $\omega($ 1420 $).$							

## $K\overline{K}^*(892) + c.c.$ MODE

VALUE (MeV)	DOCUMENT ID		TECN	COMMENT	
$\bullet$ $\bullet$ We do not use the follow	wing data for ave	rages,	fits, lim	nits, etc. ● ● ●	
$1505 \!\pm\! 19 \!\pm\! 7$	AUBERT	<b>0</b> 8s	BABR	10.6 $e^+e^- \rightarrow K\overline{K}^*(892)\gamma$	

## *ρ*(1450) WIDTH

VALUE (MeV)

DOCUMENT ID

 $400\pm60$  OUR ESTIMATE This is only an educated guess; the error given is larger than the error on the average of the published values.

## $\eta \rho^0 \text{ MODE}$

VALUE (MeV)	DOCUMENT ID	TECN	COMMENT
$\bullet$ $\bullet$ $\bullet$ We do not use the following the following the term of	lowing data for avera	ages, fits, lim	its, etc. ● ● ●
226±44	<sup>16</sup> AKHMETSHIN	01B CMD2	$e^+e^- \rightarrow \eta \gamma$
$211 \pm 31$	<sup>17</sup> AKHMETSHIN	00D CMD2	$e^+e^-  ightarrow \eta \pi^+\pi^-$
$230\pm30$	ANTONELLI	88 DM2	$e^+e^- \rightarrow \eta \pi^+\pi^-$
$60\pm15$	FUKUI	88 SPEC	$8.95 \pi^- p \rightarrow \eta \pi^+ \pi^- n$

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- <sup>16</sup>Using the data of AKHMETSHIN 01B on  $e^+e^- \rightarrow \eta\gamma$ , AKHMETSHIN 00D and \_\_ANTONELLI 88 on  $e^+e^- \rightarrow \eta\pi^+\pi^-$ .
- <sup>17</sup> Using the data of ANTONELLI 88, DOLINSKY 91, and AKHMETSHIN 00D. The energyindependent width of the  $\rho(1450)$  and  $\rho(1700)$  mesons assumed.

$\omega \pi$ MODE VALUE (MeV)	EVTS	DOCUMENT ID		TECN	COMMENT
• • • We do not use the	e followin	g data for averages	, fits,	limits, e	tc. • • •
$429{\pm}42{\pm}10$	2382	<sup>18</sup> AKHMETSHIN	<b>03</b> B	CMD2	$e^+e \rightarrow \pi^0 \pi^0 \gamma$
$547\pm\ 86^{+46}_{-45}$	341	<sup>19</sup> ALEXANDER	<b>01</b> B	CLE2	$B \rightarrow D^{(*)} \omega \pi^-$
400± 35		<sup>20</sup> EDWARDS	00A	CLE2	$\tau^- \rightarrow \omega \pi^- \nu_{\tau}$
$311\pm$ 62		<sup>21</sup> CLEGG	94	RVUE	
300		<sup>22</sup> ASTON	80C	OMEG	20–70 $\gamma p \rightarrow \omega \pi^0 p$
$320\!\pm\!100$		<sup>22</sup> BARBER	80C	SPEC	3–5 $\gamma p \rightarrow \omega \pi^0 p$

 $^{18}$  Using the data of AKHMETSHIN 03B and BISELLO 91B assuming the  $\omega \pi^0$  and  $\pi^+ \pi^-$  mass dependence of the total width.  $\rho(1700)$  mass and width fixed at 1700 MeV and 240 MeV, respectively.

<sup>19</sup> Using Breit-Wigner parameterization of the  $\rho(1450)$  and assuming the  $\omega \pi^-$  mass dependence for the total width.

<sup>20</sup> Mass-independent width parameterization.  $\rho(1700)$  mass and width fixed at 1700 MeV and 235 MeV respectively.

<sup>21</sup> Using data from BISELLO 91B, DOLINSKY 86 and ALBRECHT 87L.

<sup>22</sup>Not separated from  $b_1(1235)$ , not pure  $J^P = 1^-$  effect.

### $4\pi$ MODE

VALUE (MeV)	DOCUMENT ID		TECN	COMMENT	
$\bullet$ $\bullet$ We do not use the following	data for averages	s, fits,	limits, e	etc. • • •	
325±100	ABELE	<b>01</b> B	CBAR	$0.0 \overline{p} n \rightarrow$	$2\pi^{-}2\pi^{0}\pi^{+}$

#### $\pi\pi$ MODE

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	COMMENT
$\bullet$ $\bullet$ $\bullet$ We do not	use the follo	wing data for av	verage	s, fits, li	mits, etc. • • •
468±41	23	SCHAEL	<b>05</b> C	ALEP	$\tau^- \rightarrow \pi^- \pi^0 \nu_{\tau}$
$455\!\pm\!41$	87k <sup>24,25</sup>	ANDERSON	00A	CLE2	$\tau^- \rightarrow \pi^- \pi^0 \nu_{\tau}$
$\sim 374$	26	ABELE	<b>99</b> C	CBAR	$0.0 \ \overline{p} d \rightarrow \pi^+ \pi^- \pi^- p$
$275\!\pm\!10$		BERTIN	98	OBLX	$0.05-0.405 \ \overline{n}p \rightarrow \pi^+ \pi^+ \pi^-$
$343\!\pm\!20$	27	ABELE	97	CBAR	$\overline{p}n \rightarrow \pi^{-}\pi^{0}\pi^{0}$
$310\pm40$	25	BERTIN	<b>97</b> C	OBLX	$0.0 \ \overline{p} p \rightarrow \ \pi^+ \pi^- \pi^0$
$236\!\pm\!36$		BERTIN	<b>97</b> D	OBLX	$0.05 \ \overline{p} p \rightarrow 2\pi^+ 2\pi^-$
$269\!\pm\!31$		BISELLO	89	DM2	$e^+e^- \rightarrow \pi^+\pi^-$
$391\!\pm\!70$		DUBNICKA	89	RVUE	$e^+e^- \rightarrow \pi^+\pi^-$
$218\!\pm\!46$	28	KURDADZE	83	OLYA	0.64–1.4 $e^+e^- \rightarrow \pi^+\pi^-$

 $^{23}$  From the combined fit of the  $\tau^-$  data from ANDERSON 00A and SCHAEL 05C and  $e^+e^-$  data from the compilation of BARKOV 85, AKHMETSHIN 04, and ALOISIO 05.  $\rho(1700)$  mass and width fixed at 1713 MeV and 235 MeV, respectively. Supersedes BARATE 97M.

<sup>24</sup> From the GOUNARIS 68 parametrization of the pion form factor.

 $^{25}
ho(1700)$  mass and width fixed at 1700 MeV and 235 MeV, respectively.

 $^{26}\rho(1700)$  mass and width fixed at 1780 MeV and 275 MeV respectively.

<sup>27</sup>T-matrix pole.

 $^{28}$  Using for ho(1700) mass and width 1600  $\pm$  20 and 300  $\pm$  10 MeV respectively.

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Page 3

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K K MODE						
VALUE (MeV)	EVTS	DOCUMENT ID		TECN	CHG	COMMENT
$\bullet$ $\bullet$ $\bullet$ We do not	use the foll	owing data for a	verage	s, fits, li	mits, e	etc. • • •
$146.5 \pm 10.5$	27k <sup>2</sup>	<sup>9</sup> ABELE	<b>99</b> D	CBAR	±	$0.0 \ \overline{p} p \rightarrow \ K^+ K^- \pi^0$
<sup>29</sup> K-matrix pole	. Isospin no	ot determined, co	ould be	$\omega$ (1420	).	
$K\overline{K}^*(892) + c$	.c. MOD	E				
VALUE (MeV)		DOCUMENT IL	)	TECN	CON	IMENT
<u>\</u> \/				. C		

• • • We do not use the follo	Swing data for av	crages, mis, mi		
$418 \pm 25 \pm 4$	AUBERT	08s BABR	10.6 $e^+e^- \rightarrow$	$K\overline{K}^*(892)\gamma$

# $\rho$ (1450) DECAY MODES

	Mode	Fraction $(\Gamma_i/\Gamma)$
Г1	$\pi \pi$	seen
Г2	$4\pi$	seen
Г <sub>3</sub>	$\omega \pi$	
Г <sub>4</sub>	$a_1(1260)\pi$	
Γ <sub>5</sub>	$h_1(1170)\pi$	
Г <sub>6</sub>	$\pi(1300)\pi$	
Γ <sub>7</sub>	ho  ho	
Г <sub>8</sub>	$ ho(\pi\pi)$ S-wave	
Гg	$e^+ e^-$	seen
Γ <sub>10</sub>	$\eta   ho$	possibly seen
$\Gamma_{11}$	$a_2(1320)\pi$	not seen
Γ <sub>12</sub>	KK	not seen
Г <sub>13</sub>	$K\overline{K}^*(892)$ + c.c.	possibly seen
Г <sub>14</sub>	$\eta \gamma$	possibly seen

# $\rho(1450) \Gamma(i)\Gamma(e^+e^-)/\Gamma(total)$

$\Gamma(\pi\pi)   imes  \Gamma(e^+  e^-) / \Gamma_{\text{total}}$					
VALUE (keV)	DOCUMENT ID		TECN	COMMENT	
$\bullet \bullet \bullet$ We do not use the f	ollowing data for ave	erages	, fits, lin	nits, etc. • • •	
0.12	<sup>30</sup> DIEKMAN	88	RVUE	$e^+e^- \rightarrow \pi^+\pi^-$	
$0.027 \substack{+ 0.015 \\ - 0.010}$	<sup>31</sup> KURDADZE	83	OLYA	0.64–1.4 e <sup>+</sup> e <sup>-</sup> –	$\rightarrow \pi^+\pi^-$

$\Gamma(\eta \rho) \times \Gamma(e^+ e^-) / \Gamma_{\text{total}}$				Г <sub>10</sub> Г9/Г
VALUE (eV)	DOCUMENT ID	TECN	COMMENT	
$\bullet$ $\bullet$ $\bullet$ We do not use the follow	ving data for averages, fits,	limits, e	etc. • • •	
74±20	32 AKHMETSHIN 00D	CMD2	$e^+ e^- \rightarrow$	$\eta \pi^+ \pi^-$
91±19	ANTONELLI 88	DM2	$e^+ e^- \rightarrow$	$\eta \pi^+ \pi^-$

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$\Gamma(\eta\gamma) \times \Gamma(e^+e^-)/\Gamma_{\rm tota}$	I			Г <sub>14</sub> Г9/Г
VALUE (eV)	DOCUMENT ID	TE	CN COMMENT	
• • We do not use the follow	wing data for avera	ages, fits	, limits, etc. • • •	
<16.4	<sup>33</sup> AKHMETSHIN	05 CN	$MD2 0.60-1.38 e^+$	$e^-  ightarrow \eta \gamma$
$2.2 \pm 0.5 \pm 0.3$	<sup>34</sup> AKHMETSHIN	01B CN	$MD2 e^+e^- \rightarrow \eta\gamma$	γ
$\Gamma(K\overline{K}^*(892) + \text{c.c.}) \times \Gamma(K)$	$(e^+e^-)/\Gamma_{total}$			Г <sub>13</sub> Г9/Г
VALUE (eV)	DOCUMENT ID	TEC	CN COMMENT	
• • We do not use the follow	wing data for avera	ages, fits	, limits, etc. $\bullet \bullet \bullet$	
$127 \pm 15 \pm 6$	AUBERT	08s BA	BR 10.6 $e^+e^- \rightarrow$	• $K\overline{K}^*$ (892) $\gamma$
$^{30}$ Using total width = 235 M	1eV.			
<sup>31</sup> Using for $\rho(1700)$ mass an	d width 1600 $\pm$ 20	) and 300	0 $\pm$ 10 MeV respect	tively.
<sup>32</sup> Using the data of ANTONE	ELLI 88, DOLINSK	Y 91, and	AKHMETSHIN 00	D. The energy-
independent width of the $\rho$	$\rho(1450)$ and $\rho(170)$	0) mesor	is assumed. $(1/2)$	
width Recalculated by us	j using 1465 MeV	and 310	U MeV for the $ ho(12)$	450) mass and
$^{34}$ Using the data of AKHM	ETSHIN 01B on	e+e	$\rightarrow n\gamma$ . AKHMETS	SHIN 00D and
ANTONELLI 88 on $e^+e^-$	$\rightarrow \eta \pi^+ \pi^-$ . Re	calculate	d by us using width	of 226 MeV.
	·		, ,	
ρ(1	L450) BRANCH	ING RA	TIOS	
	-			F /F
$I(\pi\pi)/I(4\pi)$				<sub>1</sub> /  <sub>2</sub>
VALUE	DOCUMENT	ID	TECN COMMENT	-
• • • We do not use the follow	wing data for avera	ages, fits	, limits, etc. • • •	
$0.37 {\pm} 0.10$	<sup>35,36</sup> ABELE	<b>01</b> B	CBAR $0.0 \overline{p}n \rightarrow$	$\cdot$ 5 $\pi$
$\Gamma(\omega\pi)/\Gamma_{\rm table}$				Га/Г
	DOCUMENT	ID	TECN	- 3/ -
• • • We do not use the follow	wing data for aver	ages, fits	limits, etc. $\bullet \bullet \bullet$	
- 0.21		04		
$\sim 0.21$	CLEGG	94	RVUE	
$\Gamma(\pi\pi)/\Gamma(\omega\pi)$				$\Gamma_1/\Gamma_3$
VALUE	DOCUMENT	ID	TECN	=/ 0
• • • We do not use the follow	wing data for avera	ages, fits	, limits, etc. • • •	
$\sim 0.32$	CLEGG	94	RVUE	
$\Gamma(\omega \pi)/\Gamma(4\pi)$				Γ <sub>3</sub> /Γ <sub>2</sub>
VALUE	DOCUMENT	ID	TECN	
• • • We do not use the follow	wing data for avera	ages, fits	, limits, etc. • • •	
<0.14	CLEGG	88	RVUE	
$\Gamma(a_{1}(1260) - ) / \Gamma(A - )$				Г./Г.
$(a_1(1200)\pi)/((4\pi))$		10		· 4/12
VALUE	<u>DOCUMENT</u>		<u>IECN</u> <u>COMMENT</u>	
• • • We do not use the follow	wing data for avera	ages, fits,	, limits, etc. ● ● ●	
$0.27 \pm 0.08$	30 ABELE	<b>01</b> B	CBAR 0.0 $\overline{p}n \rightarrow$	$\cdot$ 5 $\pi$

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 $\Gamma(h_1(1170)\pi)/\Gamma(4\pi)$  $\Gamma_5/\Gamma_2$ VALUE DOCUMENT ID TECN COMMENT • • • We do not use the following data for averages, fits, limits, etc. • • • <sup>35</sup> ABELE  $0.08 \pm 0.04$ 01B CBAR 0.0  $\overline{p}n \rightarrow 5\pi$  $\Gamma(\pi(1300)\pi)/\Gamma(4\pi)$  $\Gamma_6/\Gamma_2$ DOCUMENT ID TECN COMMENT VALUE • • • We do not use the following data for averages, fits, limits, etc. • • • <sup>35</sup> ABELE 01B CBAR 0.0  $\overline{p}n \rightarrow 5\pi$  $0.37 \pm 0.13$  $\Gamma(\rho\rho)/\Gamma(4\pi)$  $\Gamma_7/\Gamma_2$ DOCUMENT ID VALUE TECN COMMENT • • • We do not use the following data for averages, fits, limits, etc. • • • <sup>35</sup> ABELE  $0.11 \pm 0.05$ 01B CBAR 0.0  $\overline{p}n \rightarrow 5\pi$  $\Gamma(\rho(\pi\pi)_{S-\text{wave}})/\Gamma(4\pi)$  $\Gamma_8/\Gamma_2$ VALUE DOCUMENT ID TECN COMMENT • • • We do not use the following data for averages, fits, limits, etc. • • • <sup>35</sup> ABELE 01B CBAR 0.0  $\overline{p}n \rightarrow 5\pi$  $0.17 \pm 0.09$  $\Gamma(\eta \rho) / \Gamma_{\text{total}}$  $\Gamma_{10}/\Gamma$ DOCUMENT ID VALUE TECN • • • We do not use the following data for averages, fits, limits, etc. • • • < 0.04 DONNACHIE 87B RVUE  $\Gamma(\eta \rho) / \Gamma(\omega \pi)$  $\Gamma_{10}/\Gamma_3$ VALUE DOCUMENT ID TECN COMMENT • • • We do not use the following data for averages, fits, limits, etc. • • • <sup>37</sup> DONNACHIE 91 RVUE  $\sim 0.24$ SPEC 8.95  $\pi^- p \rightarrow \omega \pi^0 n$ >2 FUKUI 91  $\Gamma(a_2(1320)\pi)/\Gamma_{\text{total}}$  $\Gamma_{11}/\Gamma$ DOCUMENT ID TECN COMMENT • • • We do not use the following data for averages, fits, limits, etc. • 37  $\pi^- p \rightarrow \eta \pi^+ \pi^- n$ 00 VES not seen AMELIN  $\Gamma(K\overline{K})/\Gamma(\omega\pi)$  $\Gamma_{12}/\Gamma_3$ DOCUMENT ID VALUE TECN • • • We do not use the following data for averages, fits, limits, etc. • • • 37 DONNACHIE 91 RVUE < 0.08  $\Gamma(K\overline{K}^*(892) + c.c.)/\Gamma_{total}$  $\Gamma_{13}/\Gamma$ DOCUMENT ID TECN COMMENT • • • We do not use the following data for averages, fits, limits, etc. • • • CLEO  $\tau^- \rightarrow K^- \pi^- K^+ \nu_{\tau}$ COAN 04 possibly seen  $\frac{35}{22}\omega\pi$  not included. 36 Using ABELE 97. <sup>37</sup> Using data from BISELLO 91B, DOLINSKY 86 and ALBRECHT 87L.

Page 6

Created: 7/17/2008 18:14

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## $\rho$ (1450) REFERENCES

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ALOISIO	05	PL B606 12	A. Aloisio <i>et al.</i>	(KLOE Collab.)
SCHAEL	05C	PRPL 421 191	S. Schael <i>et al.</i>	(ÀLEPH Collab.)
AKHMETSHIN	04	PL B578 285	R.R. Akhmetshin <i>et al.</i>	(Novosibirsk CMD-2 Collab.)
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AKHMETSHIN	03B	PL B562 173	R.R. Akhmetshin <i>et al.</i>	(Novosibirsk CMD-2 Collab.)
ABELE	01B	EP.J C21 261	A. Abele <i>et al.</i>	(Crystal Barrel Collab.)
AKHMETSHIN	01B	PL B509 217	R.R. Akhmetshin et al.	(Novosibirsk CMD-2 Collab.)
ALEXANDER	01B	PR D64 092001	J.P. Alexander et al.	(CLEO Collab.)
AKHMETSHIN	00D	PL B489 125	R.R. Akhmetshin <i>et al.</i>	(Novosibirsk CMD-2 Collab.)
AMELIN	00	NP A668 83	D. Amelin <i>et al.</i>	(VES Collab.)
ANDERSON	00A	PR D61 112002	S. Anderson <i>et al.</i>	(CLEO Collab.)
EDWARDS	00A	PR D61 072003	K.W. Edwards <i>et al.</i>	(CLEO Collab.)
ABELE	99C	PL B450 275	A. Abele <i>et al.</i>	(Crystal Barrel Collab.)
ABELE	99D	PL B468 178	A. Abele <i>et al.</i>	(Crystal Barrel Collab.)
BERTIN	98	PR D57 55	A. Bertin <i>et al.</i>	(OBELIX Collab.)
ABELE	97	PL B391 191	A. Abele <i>et al.</i>	(Crystal Barrel Collab.)
ACHASOV	97	PR D55 2663	N.N. Achasov et al.	(NOVM)
BARATE	97M	ZPHY C76 15	R. Barate <i>et al.</i>	(ALEPH Collab.)
BERTIN	97C	PL B408 476	A. Bertin <i>et al.</i>	(OBELIX Collab.)
BERTIN	97D	PL B414 220	A. Bertin <i>et al.</i>	(OBELIX Collab.)
CLEGG	94	ZPHY C62 455	A.B. Clegg, A. Donnachie	(LANC. MCHS)
BISELLO	91B	NPBPS B21 111	D. Bisello	(DM2 Collab.)
DOLINSKY	91	PRPL 202 99	S.I. Dolinsky <i>et al.</i>	(NOVO)
DONNACHIE	91	ZPHY C51 689	A. Donnachie. A.B. Clegg	(MCHS, LANC)
FUKUI	91	PL B257 241	S. Fukui <i>et al.</i> (S	SUGL NAGO, KEK, KYOT+)
ARMSTRONG	89E	PL B228 536	T.A. Armstrong, M. Benavo	un (ATHU, BARI, BIRM+)
BISELLO	89	PL B220 321	D Bisello <i>et al</i>	(DM2 Collab )
DUBNICKA	89	JPG 15 1349	S. Dubnicka <i>et al.</i>	(JINR, SLOV)
ANTONELLI	88	PL B212 133	A. Antonelli <i>et al.</i>	(DM2 Collab.)
CLEGG	88	ZPHY C40 313	A.B. Clegg, A. Donnachie	(MCHS. LANC)
DIEKMAN	88	PRPL 159 99	B. Diekmann	(BONN)
FUKUI	88	PL B202 441	S. Fukui <i>et al.</i> (S	SUGL NAGO, KEK, KYOT+)
ALBRECHT	87L	PL B185 223	H. Albrecht <i>et al.</i>	(ARGUS Collab.)
DONNACHIE	87B	ZPHY C34 257	A. Donnachie, A.B. Clegg	(MCHS. LANC)
DOLINSKY	86	PL B174 453	S.I. Dolinsky <i>et al.</i>	(NOVO)
BARKOV	85	NP B256 365	L.M. Barkov <i>et al.</i>	(NOVO)
KURDADZE	83	JETPL 37 733	L.M. Kurdadze <i>et al.</i>	(NOVO)
		Translated from ZETFP 3	37 613.	()
ASTON	80C	PL 92B 211	D. Aston (BONN, C	ERN, EPOL, GLAS, LANC+)
BARBER	80C	ZPHY C4 169	D.P. Barber <i>et al.</i>	(DARE, LANC, SHEF)
GOUNARIS	68	PRL 21 244	G.J. Gounaris, J.J. Sakurai	
	-	OTHER	RELATED PAPERS	
ACHASOV	07A	PR D76 072012	M.N. Achasov et al	(SND Collab)
AKHMETSHIN	07	PI B648 28	R Akhmetshin <i>et al</i>	(Novosibirsk CMD-2 Collab.)
FUIIKAWA	07	NPBPS 169 36	M Fujikawa <i>et al</i>	(BELLE Collab.)
LI	07A	PR D76 094016	B.A. Li	

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AKHMETSHIN	07	PL B648 28	R. Akhmetshin et al.	(Novosibirsk CMD-2 Collab.)
FUJIKAWA	07	NPBPS 169 36	M. Fujikawa <i>et al.</i>	(BELLE Collab.)
LI	07A	PR D76 094016	B.A. Li	
LIU	07B	PR D75 074017	X. Liu <i>et al.</i>	
ZHANG	07C	PR D76 036004	A. Zhang <i>et al.</i>	
ABLIKIM	06S	PRL 97 142002	M. Ablikim et al.	(BES Collab.)
ACHASOV	06D	JETP 103 720	N.N. Achasov <i>et al.</i>	(SND Collab.)
		Translated from ZETF 13	0 831.	, , , , , , , , , , , , , , , , , , ,
AUBERT	06L	PR D74 012001	B. Aubert <i>et al.</i>	(BABAR Collab.)
DAVIER	06	RMP 78 1043	M. Davier, A. Hocker, Z.	Zhang (LALO, PARIN+)
DING	06	PL B643 33	GJ. Ding, ML. Yan	(CST)
GUO	06	NP A773 78	F.K. Guo <i>et al.</i>	
ACHASOV	05A	JETP 101 1053	M.N. Achasov et al.	(Novosibirsk SND Collab.)
		Translated from ZETF 12	8 1201.	
AUBERT	05D	PR D71 052001	B. Aubert <i>et al.</i>	(BABAR Collab.)
AULCHENKO	05	JETPL 82 743	V.M. Aulchenko et al.	(Novosibirsk CMD-2 Collab.)
		Translated from ZETFP 8	32 841.	
EBERT	05	MPL A20 1887	D. Ebert, R.N. Faustov,	V.O. Galkin
AKHMETSHIN	04C	PL B595 101	R.R. Akhmetshin et al.	(Novosibirsk CMD-2 Collab.)
AMSLER	04A	NP A740 130	C. Amsler <i>et al.</i>	
ACHASOV	03C	JETP 96 789	M.N. Achasov <i>et al.</i>	(Novosibirsk SND Collab.)
		Translated from ZETF 12	3 899.	

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Iranslated from YAF 65 158.Iranslated from YAF 65 158.CLOSE02PR D65 092003F.E. Close, A. Donnachie, Yu.S. KalashnikovaADAMS01BPL B516 264G.S. Adams et al.(BNL E852 Collab.)ACHASOV001PL B486 29M.N. Achasov et al.(Novosibirsk SND Collab.)ACHASOV003PR D62 117503N.N. Achasov, A.A. KozhevnikovAULCHENKO00AJETP 90 927V.M. Aulchenko et al.(Novosibirsk SND Collab.)BELOZEROVA98PPN 29 63T.S. Belozerova, V.K. Henner Translated from FECAY 29 148.ABELE97HPL B415 280A. Abele et al.(Crystal Barrel Collab.)BARNES97PR D55 4157T. Barnes et al.(ORNL, RAL, MCHS)URHEIM97NPBPS 55C 359J. Urheim(CLEO Collab.)URHEIM97NPBPS 55C 359J. Urheim(CLEO Collab.)	ACHASOV	02B	PAN 65 153 N.N. Achas	sov, A.A. Kozhevniko	V
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ACHASOV       003       FR D03       FR D13       N.N. Achasov, A.A. Rozhevnikov         AULCHENKO       004       JETP 90 927       V.M. Aulchenko et al.       (Novosibirsk SND Collab.)         Translated from ZETF 117 1067.       Translated from FECAY 29 148.       (Novosibirsk SND Collab.)         BELOZEROVA       98       PPN 29 63       T.S. Belozerova, V.K. Henner         Translated from FECAY 29 148.       (Crystal Barrel Collab.)         BARNES       97       PR D55 4157       T. Barnes et al.       (ORNL, RAL, MCHS)         CLOSE       97C       PR D55 1584       F.E. Close et al.       (RAL, MCHS)         URHEIM       97       NPBPS 55C 359       J. Urheim       (CLOC Collab.)         OCHASOV       968       PNN 50 1262       N.M. Acharov, C.N. Shortakov, (NVA)	ACHASOV	001	PD D62 117502 N.N. Acha	sov et al.	(NOVOSIDIISK SIND COILAD.)
ADECHENKO       00A       JETF 9927       Yulk: Automatic and the set al.       (Novosibitsk SND Collab.)         Translated from ZETF 117 1067.         BELOZEROVA       98       PPN 29 63       T.S. Belozerova, V.K. Henner         Translated from FECAY 29 148.       ABELE       97H       PL B415 280       A. Abele et al.       (Crystal Barrel Collab.)         BARNES       97       PR D55 4157       T. Barnes et al.       (ORNL, RAL, MCHS)         CLOSE       97C       PR D55 1584       F.E. Close et al.       (RAL, MCHS)         URHEIM       97       NPBPS 55C 359       J. Urheim       (CLEO Collab.)         OCMASOV       96B       PAN F0 1262       N.M. Acharov, C.N. Shortakov, (NVA)		003	IETD 00 027 V/M Aulek	oorko ot al	(Novosibirsk SND Collab.)
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ABELE         97H         PL         B415         280         A. Abele et al.         (Crystal Barrel Collab.)           BARNES         97         PR         D55         4157         T. Barnes et al.         (ORNL, RAL, MCHS)           CLOSE         97C         PR         D56         1584         F.E. Close et al.         (RAL, MCHS)           URHEIM         97         NPBPS         55C         359         J. Urheim         (CLEO Collab.)           ACHASOV         96B         PANL 50         N.M. Achasov, C.N. Shortakov, (NUMA)         (NUMA)			Translated from FECAY 29 148.		
BARNES         97         PR         D55         4157         T. Barnes et al.         (ORNL, RAL, MCHS)           CLOSE         97C         PR         D56         1584         F.E. Close et al.         (RAL, MCHS)           URHEIM         97         NPBPS         55C         359         J. Urheim         (CLEO Collab.)           ACHASOV         96B         PAN E0         1262         N.N. Asharov, C.N. Shortakov, (N.VAN)         (N.VAN)	ABELE	97H	PL B415 280 A. Abele e	t al.	(Crystal Barrel Collab.)
CLOSE         97C         PR D56 1584         F.E. Close et al.         (RAL, MCHS)           URHEIM         97         NPBPS 55C 359         J. Urheim         (CLEO Collab.)           ACHASOV         96B         PAN, 50, 1262         N.N. Achasov, C.N. Shortakov, (NOVAN)	BARNES	97	PR D55 4157 T. Barnes	et al.	(ORNL, RAL, MCHS)
URHEIM 97 NPBPS 55C 359 J. Urheim (CLEO Collab.)	CLOSE	97C	PR D56 1584 F.E. Close	et al.	(RAL, MCHS)
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MURADOV 94 PAN 57 864 R.K. Muradov (BAKU)	MURADOV	94	PAN 57 864 R.K. Mura	vob	(BAKU)
LANDSBERG 92 SJNP 55 1051 L.G. Landsberg (SERP)	LANDSBERG	92	SJNP 55 1051 L.G. Lands	berg	(SERP)
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BRAU 88 PR D37 2379 J.E. Brau <i>et al.</i>	BRAU	88	PR D37 2379 J.E. Brau	et al.	(
AULCHENKO 87B JETPL 45 145 V.M. Aulchenko et al. (NOVO)	AULCHENKO	87B	JETPL 45 145 V.M. Aulch	ienko <i>et al.</i>	(NOVO)
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KURDADZE 80 JETPL 43 043 L.M. Kurdadze et al. (NOVO)	KURDADZE	80	JEIPL 43 043 L.IVI. Kurda	idze <i>et al.</i>	(NOVO)
PARKOV SE ND P266 265 I M Parkov et al (NOVO)	PARKOV/	0E	ND D256 265 I M Darke	w at al	
DARNOV 03 NF D250 303 L.NI. Darkov et al. (NOVO)		00 0E	INP D230 303 L.IVI. Darko	vela.	
ADE 94D DD 52 751 V Abo of al (FADO, LALO, CLER+)		00	DDI 52 751 K Abo at	et al.	(PADO, LALO, CLER+)
ADE 04D FRL 33 /31 R. ADE et al. (DONN CEDN CLASE)		04D	ND D242 1 M Atkinge	dl. natal	(PONN CEDN CLAST)
ATRINSON 04C NF 6243 I M. Aklison et al. (DONN, CERN, GLAS+)		040	NP D245 I IVI. ALKINSO	n et al.	(DONN, CERN, GLAS+)
CURDIER 52 PL 1095 129 A. Cordier et al. (LALO)		02 01	PL 109B 129 A. Cordier	et al.	(LALU)
BISELLO 81 PL IU/B 145 D. BISEIIO et al. (DMI COIBD.)	BISELLO	81	PL IU/B 145 D. Biselio	et al.	(DMI Collab.)
KILLIAN 80 PR DZI 3005 1.J. KIIIIA <i>et al.</i> (CORN)		80	PR D21 3005 I.J. Killian	et al.	(CORN)
CUSME /0 PL 03B 352 G. Cosme et al. (URSAY)	COSME	70	PL 03B 352 G. Cosme	et al.	
BINGHAM (2B PL 41B 035 H.H. Bingham et al. (LBL, UCB, SLAC)	BINGHAM	12B	PL 41B 035 H.H. Bingh	am <i>et al.</i>	(LBL, UCB, SLAC)
FREINKIEL (2 NP B4/01 P. Frenkiel et al. (CDEF, CERN)	FRENKIEL	72	NP B4/ 01 P. Frenkiel	et al.	(CDEF, CERN)
LAYSSAC /I NC 6A 134 J. Layssac, F.M. Kenard (MONP)	LAYSSAC	11	INC 0A 134 J. Layssac,	F.IVI. Kenard	(MONP)

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