

$\rho(1450)$ $I^G(J^{PC}) = 1^+(1^{--})$ See the mini-review under the $\rho(1700)$. **$\rho(1450)$ MASS**VALUE (MeV)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.

 $\eta\rho^0$ MODEVALUE (MeV)DOCUMENT IDTECNCOMMENT

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

1497±14	¹ AKHMETSHIN 01B CMD2	$e^+e^- \rightarrow \eta\gamma$
1421±15	² AKHMETSHIN 00D CMD2	$e^+e^- \rightarrow \eta\pi^+\pi^-$
1470±20	ANTONELLI 88 DM2	$e^+e^- \rightarrow \eta\pi^+\pi^-$
1446±10	FUKUI 88 SPEC	$8.95\pi^-p \rightarrow \eta\pi^+\pi^-n$

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

² Using the data of ANTONELLI 88, DOLINSKY 91, and AKHMETSHIN 00D. The energy-independent width of the $\rho(1450)$ and $\rho(1700)$ mesons assumed.

 $\omega\pi$ MODEVALUE (MeV)EVTSDOCUMENT IDTECNCOMMENT

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

1582±17±25	2382	³ AKHMETSHIN 03B CMD2	$e^+e^- \rightarrow \pi^0\pi^0\gamma$
1349±25 ⁺¹⁰ ₋₅	341	⁴ ALEXANDER 01B CLE2	$B \rightarrow D^{(*)}\omega\pi^-$
1523±10		⁵ EDWARDS 00A CLE2	$\tau^- \rightarrow \omega\pi^-\nu_\tau$
1463±25		⁶ CLEGG 94 RVUE	
1250		⁷ ASTON 80C OMEG 20–70 $\gamma p \rightarrow \omega\pi^0 p$	
1290±40		⁷ BARBER 80C SPEC 3–5 $\gamma p \rightarrow \omega\pi^0 p$	

³ 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.

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

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

⁶ Using data from BISELLO 91B, DOLINSKY 86 and ALBRECHT 87L.

⁷ Not separated from $b_1(1235)$, not pure $J^P = 1^-$ effect.

 4π MODEVALUE (MeV)DOCUMENT IDTECNCOMMENT

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

1435±40	ABELE 01B CBAR	$0.0\bar{p}n \rightarrow 2\pi^-\pi^0\pi^+$
1350±50	ACHASOV 97 RVUE	$e^+e^- \rightarrow 2(\pi^+\pi^-)$
1449± 4	⁸ ARMSTRONG 89E OMEG 300 $p\bar{p} \rightarrow$	$p\bar{p}2(\pi^+\pi^-)$

⁸ Not clear whether this observation has $I=1$ or 0.

$\pi\pi$ MODE

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
1406 \pm 15	87k	9,10 ANDERSON	00A CLE2	$\tau^- \rightarrow \pi^- \pi^0 \nu_\tau$
\sim 1368		11 ABELE	99C CBAR	$0.0 \bar{p}d \rightarrow \pi^+ \pi^- \pi^- p$
1348 \pm 33		BERTIN	98 OBLX	$0.05\text{--}0.405 \bar{n}p \rightarrow \pi^+ \pi^+ \pi^-$
1411 \pm 14		12 ABELE	97 CBAR	$\bar{p}n \rightarrow \pi^- \pi^0 \pi^0$
1370 $^{+90}_{-70}$		ACHASOV	97 RVUE	$e^+ e^- \rightarrow \pi^+ \pi^-$
1380 \pm 24		13 BARATE	97M ALEP	$\tau^- \rightarrow \pi^- \pi^0 \nu_\tau$
1359 \pm 40		10 BERTIN	97C OBLX	$0.0 \bar{p}p \rightarrow \pi^+ \pi^- \pi^0$
1282 \pm 37		BERTIN	97D OBLX	$0.05 \bar{p}p \rightarrow 2\pi^+ 2\pi^-$
1424 \pm 25		BISELLLO	89 DM2	$e^+ e^- \rightarrow \pi^+ \pi^-$
1292 \pm 17		14 KURDADZE	83 OLYA	$0.64\text{--}1.4 e^+ e^- \rightarrow \pi^+ \pi^-$

⁹ From the GOUNARIS 68 parametrization of the pion form factor.

¹⁰ $\rho(1700)$ mass and width fixed at 1700 MeV and 235 MeV, respectively.

¹¹ $\rho(1700)$ mass and width fixed at 1780 MeV and 275 MeV respectively.

¹² T-matrix pole.

¹³ Fixing $\rho(1450)$ width to 310 MeV and $\rho(1700)$ mass and width to 1700 MeV and 235 MeV respectively.

¹⁴ Using for $\rho(1700)$ mass and width 1600 ± 20 and 300 ± 10 MeV respectively.

$\phi\pi$ MODE

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	CHG	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
1480 \pm 40		15,16 BITYUKOV	87 SPEC	0	$32.5 \pi^- p \rightarrow \phi \pi^0 n$

¹⁵ DONNACHIE 91 suggests this is a different particle.

¹⁶ Not seen by ABELE 97H.

$K\bar{K}$ MODE

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	CHG	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
1422.8 \pm 6.5	27k	17 ABELE	99D CBAR	\pm	$0.0 \bar{p}p \rightarrow K^+ K^- \pi^0$

¹⁷ K-matrix pole. Isospin not determined, could be $\omega(1420)$.

MIXED MODES

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
1265.5 \pm 75.3		DUBNICKA	89 RVUE	$e^+ e^- \rightarrow \pi^+ \pi^-$

$\rho(1450)$ WIDTH

VALUE (MeV)	DOCUMENT ID
400 \pm 60 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 following data for averages, fits, limits, etc. • • •			
226±44	18 AKHMETSHIN 01B	CMD2	$e^+ e^- \rightarrow \eta\gamma$
211±31	19 AKHMETSHIN 00D	CMD2	$e^+ e^- \rightarrow \eta\pi^+\pi^-$
230±30	ANTONELLI 88	DM2	$e^+ e^- \rightarrow \eta\pi^+\pi^-$
60±15	FUKUI 88	SPEC	$8.95 \pi^- p \rightarrow \eta\pi^+\pi^- n$
18	Using the data of AKHMETSHIN 01B on $e^+ e^- \rightarrow \eta\gamma$, AKHMETSHIN 00D and ANTONELLI 88 on $e^+ e^- \rightarrow \eta\pi^+\pi^-$.		
19	Using the data of ANTONELLI 88, DOLINSKY 91, and AKHMETSHIN 00D. The energy-independent width of the $\rho(1450)$ and $\rho(1700)$ mesons assumed.		

 $\omega\pi$ 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. • • •

429± 42±10	2382	20 AKHMETSHIN 03B	CMD2	$e^+ e^- \rightarrow \pi^0\pi^0\gamma$
547± 86 ⁺⁴⁶ ₋₄₅	341	21 ALEXANDER 01B	CLE2	$B \rightarrow D^{(*)}\omega\pi^-$
400± 35		22 EDWARDS 00A	CLE2	$\tau^- \rightarrow \omega\pi^-\nu_\tau$
311± 62		23 CLEGG 94	RVUE	
300		24 ASTON 80C	OMEG	$20\text{--}70 \gamma p \rightarrow \omega\pi^0 p$
320±100		24 BARBER 80C	SPEC	$3\text{--}5 \gamma p \rightarrow \omega\pi^0 p$
20	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.			
21	Using Breit-Wigner parameterization of the $\rho(1450)$ and assuming the $\omega\pi^-$ mass dependence for the total width.			
22	Mass-independent width parameterization. $\rho(1700)$ mass and width fixed at 1700 MeV and 235 MeV respectively.			
23	Using data from BISELLO 91B, DOLINSKY 86 and ALBRECHT 87L.			
24	Not separated from $b_1(1235)$, not pure $J^P = 1^-$ effect.			

 4π MODE

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

 $\pi\pi$ MODE

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
455±41	25,26 ANDERSON 00A	CLE2	$\tau^- \rightarrow \pi^-\pi^0\nu_\tau$	
~374	27 ABELE 99C	CBAR	$0.0 \bar{p}d \rightarrow \pi^+\pi^-\pi^-p$	
275±10	BERTIN 98	OBLX	$0.05\text{--}0.405 \bar{n}p \rightarrow \pi^+\pi^+\pi^-$	
343±20	28 ABELE 97	CBAR	$\bar{p}n \rightarrow \pi^-\pi^0\pi^0$	
310±40	26 BERTIN 97C	OBLX	$0.0 \bar{p}p \rightarrow \pi^+\pi^-\pi^0$	
236±36	BERTIN 97D	OBLX	$0.05 \bar{p}p \rightarrow 2\pi^+ 2\pi^-$	
269±31	BISELLO 89	DM2	$e^+ e^- \rightarrow \pi^+\pi^-$	
218±46	29 KURDADZE 83	OLYA	$0.64\text{--}1.4 e^+ e^- \rightarrow \pi^+\pi^-$	

- 25 From the GOUNARIS 68 parametrization of the pion form factor.
 26 $\rho(1700)$ mass and width fixed at 1700 MeV and 235 MeV, respectively.
 27 $\rho(1700)$ mass and width fixed at 1780 MeV and 275 MeV respectively.
 28 T-matrix pole.
 29 Using for $\rho(1700)$ mass and width 1600 ± 20 and 300 ± 10 MeV respectively.

 $\phi\pi$ MODE

VALUE (MeV)	DOCUMENT ID	TECN	CHG	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
130 ± 60	30,31 BITYUKOV	87 SPEC	0	$32.5 \pi^- p \rightarrow \phi\pi^0 n$

30 DONNACHIE 91 suggests this is a different particle.

31 Not seen by ABELE 97H.

 $K\bar{K}$ MODE

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	CHG	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
146.5 ± 10.5	27k	32 ABELE	99D CBAR	\pm	$0.0 \bar{p}p \rightarrow K^+ K^- \pi^0$

32 K-matrix pole. Isospin not determined, could be $\omega(1420)$.

MIXED MODES

VALUE (MeV)	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •			
391 ± 70	DUBNICKA	89 RVUE	$e^+ e^- \rightarrow \pi^+ \pi^-$

 $\rho(1450)$ DECAY MODES

Mode	Fraction (Γ_i/Γ)	Confidence level
$\Gamma_1 \pi\pi$	seen	
$\Gamma_2 4\pi$	seen	
$\Gamma_3 \omega\pi$	$<2.0\%$	95%
$\Gamma_4 a_1(1260)\pi$		
$\Gamma_5 h_1(1170)\pi$		
$\Gamma_6 \pi(1300)\pi$		
$\Gamma_7 \rho\rho$		
$\Gamma_8 \rho(\pi\pi)_{S\text{-wave}}$		
$\Gamma_9 e^+ e^-$	seen	
$\Gamma_{10} \eta\rho$	$<4\%$	
$\Gamma_{11} a_2(1320)\pi$	not seen	
$\Gamma_{12} \phi\pi$	$<1\%$	
$\Gamma_{13} K\bar{K}$	$<1.6 \times 10^{-3}$	95%
$\Gamma_{14} \eta\gamma$	possibly seen	

$\rho(1450) \Gamma(i) \Gamma(e^+ e^-)/\Gamma(\text{total})$ $\Gamma(\pi\pi) \times \Gamma(e^+ e^-)/\Gamma_{\text{total}}$ $\Gamma_1 \Gamma_9/\Gamma$

<u>VALUE</u> (keV)	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
• • • We do not use the following data for averages, fits, limits, etc. • • •			
0.12	33 DIEKMAN	88 RVUE	$e^+ e^- \rightarrow \pi^+ \pi^-$
$0.027^{+0.015}_{-0.010}$	34 KURDADZE	83 OLYA	$0.64-1.4 e^+ e^- \rightarrow \pi^+ \pi^-$

 $\Gamma(\eta\rho) \times \Gamma(e^+ e^-)/\Gamma_{\text{total}}$ $\Gamma_{10} \Gamma_9/\Gamma$

<u>VALUE</u> (eV)	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
• • • We do not use the following data for averages, fits, limits, etc. • • •			
74 ± 20	35 AKHMETSHIN 00D	CMD2	$e^+ e^- \rightarrow \eta \pi^+ \pi^-$
91 ± 19	ANTONELLI	88 DM2	$e^+ e^- \rightarrow \eta \pi^+ \pi^-$

 $\Gamma(\phi\pi) \times \Gamma(e^+ e^-)/\Gamma_{\text{total}}$ $\Gamma_{12} \Gamma_9/\Gamma$

<u>VALUE</u> (eV)	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<70	90	36 AULCHENKO	87B ND	$e^+ e^- \rightarrow K_S^0 K_L^0 \pi^0$

 $\Gamma(\eta\gamma) \times \Gamma(e^+ e^-)/\Gamma_{\text{total}}$ $\Gamma_{14} \Gamma_9/\Gamma$

<u>VALUE</u> (units 10^{-9})	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
• • • We do not use the following data for averages, fits, limits, etc. • • •			

- • •** We do not use the following data for averages, fits, limits, etc. **• • •**
- <41.1
 - $10.0 \pm 2.2 \pm 1.5$
 - 33 Using total width = 235 MeV.
 - 34 Using for $\rho(1700)$ mass and width 1600 ± 20 and 300 ± 10 MeV respectively.
 - 35 Using the data of ANTONELLI 88, DOLINSKY 91, and AKHMETSHIN 00D. The energy-independent width of the $\rho(1450)$ and $\rho(1700)$ mesons assumed.
 - 36 Using mass 1480 ± 40 MeV and total width 130 ± 60 MeV of BITYUKOV 87.
 - 37 From 2γ decay mode of η using 1465 MeV and 310 MeV for the $\rho(1450)$ mass and width.
 - 38 Using the data of AKHMETSHIN 01B on $e^+ e^- \rightarrow \eta\gamma$, AKHMETSHIN 00D and ANTONELLI 88 on $e^+ e^- \rightarrow \eta\pi^+ \pi^-$.

 $\rho(1450) \text{ BRANCHING RATIOS}$ $\Gamma(\eta\rho)/\Gamma_{\text{total}}$ Γ_{10}/Γ

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>
<0.04	DONNACHIE	87B RVUE

 $\Gamma(a_2(1320)\pi)/\Gamma_{\text{total}}$ Γ_{11}/Γ

<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. • • •			

- • •** We do not use the following data for averages, fits, limits, etc. **• • •**
- not seen AMELIN 00 VES $37 \pi^- p \rightarrow \eta\pi^+ \pi^- n$

 $\Gamma(\phi\pi)/\Gamma(\omega\pi)$ Γ_{12}/Γ_3

<u>VALUE</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>CHG</u>	<u>COMMENT</u>
>0.5	95	BITYUKOV	87 SPEC	0	$32.5 \pi^- p \rightarrow \phi\pi^0 n$

$\Gamma(\omega\pi)/\Gamma(4\pi)$

VALUE	DOCUMENT ID	TECN
<0.14	CLEGG	88 RVUE

Γ_3/Γ_2

$\Gamma(a_1(1260)\pi)/\Gamma(4\pi)$

VALUE	DOCUMENT ID	TECN	COMMENT
$\bullet \bullet \bullet$ We do not use the following data for averages, fits, limits, etc. $\bullet \bullet \bullet$			

0.27 ± 0.08 ³⁹ ABELE 01B CBAR $0.0 \bar{p}n \rightarrow 5\pi$

Γ_4/Γ_2

$\Gamma(h_1(1170)\pi)/\Gamma(4\pi)$

VALUE	DOCUMENT ID	TECN	COMMENT
$\bullet \bullet \bullet$ We do not use the following data for averages, fits, limits, etc. $\bullet \bullet \bullet$			

0.08 ± 0.04 ³⁹ ABELE 01B CBAR $0.0 \bar{p}n \rightarrow 5\pi$

Γ_5/Γ_2

$\Gamma(\pi(1300)\pi)/\Gamma(4\pi)$

VALUE	DOCUMENT ID	TECN	COMMENT
$\bullet \bullet \bullet$ We do not use the following data for averages, fits, limits, etc. $\bullet \bullet \bullet$			

0.37 ± 0.13 ³⁹ ABELE 01B CBAR $0.0 \bar{p}n \rightarrow 5\pi$

Γ_6/Γ_2

$\Gamma(\rho\rho)/\Gamma(4\pi)$

VALUE	DOCUMENT ID	TECN	COMMENT
$\bullet \bullet \bullet$ We do not use the following data for averages, fits, limits, etc. $\bullet \bullet \bullet$			

0.11 ± 0.05 ³⁹ ABELE 01B CBAR $0.0 \bar{p}n \rightarrow 5\pi$

Γ_7/Γ_2

$\Gamma(\rho(\pi\pi)_S\text{-wave})/\Gamma(4\pi)$

VALUE	DOCUMENT ID	TECN	COMMENT
$\bullet \bullet \bullet$ We do not use the following data for averages, fits, limits, etc. $\bullet \bullet \bullet$			

0.17 ± 0.09 ³⁹ ABELE 01B CBAR $0.0 \bar{p}n \rightarrow 5\pi$

Γ_8/Γ_2

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

VALUE	DOCUMENT ID	TECN	COMMENT
$\bullet \bullet \bullet$ We do not use the following data for averages, fits, limits, etc. $\bullet \bullet \bullet$			

0.37 ± 0.10 ^{39,40} ABELE 01B CBAR $0.0 \bar{p}n \rightarrow 5\pi$

Γ_1/Γ_2

$\Gamma(\eta\rho)/\Gamma(\omega\pi)$

VALUE	DOCUMENT ID	TECN	COMMENT
~ 0.24 ⁴¹ DONNACHIE 91 RVUE			

$\bullet \bullet \bullet$ We do not use the following data for averages, fits, limits, etc. $\bullet \bullet \bullet$

>2 FUKUI 91 SPEC $8.95 \pi^- p \rightarrow \omega\pi^0 n$

Γ_{10}/Γ_3

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

VALUE	DOCUMENT ID	TECN
~ 0.21	CLEGG	94 RVUE

Γ_3/Γ

$\Gamma(\pi\pi)/\Gamma(\omega\pi)$

VALUE	DOCUMENT ID	TECN
~ 0.32	CLEGG	94 RVUE

Γ_1/Γ_3

$\Gamma(\phi\pi)/\Gamma_{\text{total}}$	Γ_{12}/Γ		
VALUE	DOCUMENT ID	TECN	COMMENT
<0.01	41 DONNACHIE 91 RVUE		
• • • We do not use the following data for averages, fits, limits, etc. • • •			
not seen	ABELE	97H CBAR	$\bar{p}p \rightarrow K_L^0 K_S^0 \pi^0 \pi^0$
$\Gamma(K\bar{K})/\Gamma(\omega\pi)$	Γ_{13}/Γ_3		
VALUE	DOCUMENT ID	TECN	
<0.08	41 DONNACHIE 91 RVUE		
39 $\omega\pi$ not included.			
40 Using ABELE 97.			
41 Using data from BISELLO 91B, DOLINSKY 86 and ALBRECHT 87L.			

$p(1450)$ REFERENCES

AKHMETSHIN 05	PL B605 26	R.R. Akhmetshin <i>et al.</i>	(Novosibirsk CMD-2 Collab.)
AKHMETSHIN 03B	PL B562 173	R.R. Akhmetshin <i>et al.</i>	(Novosibirsk CMD-2 Collab.)
ABELE 01B	EPJ C21 261	A. Abele <i>et al.</i>	(Crystal Barrel Collab.)
AKHMETSHIN 01B	PL B509 217	R.R. Akhmetshin <i>et al.</i>	(Novosibirsk CMD-2 Collab.)
ALEXANDER 01B	PR D64 092001	J.P. Alexander <i>et al.</i>	(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.)
ABELE 97H	PL B415 280	A. Abele <i>et al.</i>	(Crystal Barrel Collab.)
ACHASOV 97	PR D55 2663	N.N. Achasov <i>et al.</i>	(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>	(SUGI, NAGO, KEK, KYOT+)
ARMSTRONG 89E	PL B228 536	T.A. Armstrong, M. Benayoun	(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 159 101	B. Diekmann	(BONN)
FUKUI 88	PL B202 441	S. Fukui <i>et al.</i>	(SUGI, NAGO, KEK, KYOT+)
ALBRECHT 87L	PL B185 223	H. Albrecht <i>et al.</i>	(ARGUS Collab.)
AULCHENKO 87B	JETPL 45 145	V.M. Aulchenko <i>et al.</i>	(NOVO)
	Translated from ZETFP 45 118.		
BITYUKOV 87	PL B188 383	S.I. Bityukov <i>et al.</i>	(SERP)
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)
KURDADZE 83	JETPL 37 733	L.M. Kurdadze <i>et al.</i>	(NOVO)
	Translated from ZETFP 37 613.		
ASTON 80C	PL 92B 211	D. Aston	(BONN, CERN, EPOL, GLAS, LANC+)
BARBER 80C	ZPHY C4 169	D.P. Barber <i>et al.</i>	(DARE, LANC, SHEF)
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OTHER RELATED PAPERS

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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 123 899.		
ACHASOV	02B	PAN 65 153	N.N. Achasov, A.A. Kozhevnikov	
		Translated from YAF 65 158.		
CLOSE	02	PR D65 092003	F.E. Close, A. Donnachie, Yu.S. Kalashnikova	
ADAMS	01B	PL B516 264	G.S. Adams <i>et al.</i>	(BNL E852 Collab.)
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ACHASOV	00J	PR D62 117503	N.N. Achasov, A.A. Kozhevnikov	
AULCHENKO	00A	JETP 90 927	V.M. Aulchenko <i>et al.</i>	(Novosibirsk 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 <i>et al.</i>	(Crystal Barrel Collab.)
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CLOSE	97C	PR D56 1584	F.E. Close <i>et al.</i>	(RAL, MCHS)
URHEIM	97	NPBPS 55C 359	J. Urheim	(CLEO Collab.)
ACHASOV	96B	PAN 59 1262	N.N. Achasov, G.N. Shestakov	(NOVM)
		Translated from YAF 59 1319.		
MURADOV	94	PAN 57 864	R.K. Muradov	(BAKU)
LANDSBERG	92	SJNP 55 1051	L.G. Landsberg	(SERP)
		Translated from YAF 55 1896.		
BRAU	88	PR D37 2379	J.E. Brau <i>et al.</i>	
KURDADZE	86	JETPL 43 643	L.M. Kurdadze <i>et al.</i>	(NOVO)
		Translated from ZETFP 43 497.		
BARKOV	85	NP B256 365	L.M. Barkov <i>et al.</i>	(NOVO)
BISELLO	85	LAL 85-15	D. Bisello <i>et al.</i>	(PADO, LALO, CLER+)
ABE	84B	PRL 53 751	K. Abe <i>et al.</i>	
ATKINSON	84C	NP B243 1	M. Atkinson <i>et al.</i>	(BONN, CERN, GLAS+)
CORDIER	82	PL 109B 129	A. Cordier <i>et al.</i>	(LALO)
BISELLO	81	PL 107B 145	D. Bisello <i>et al.</i>	(DM1 Collab.)
KILLIAN	80	PR D21 3005	T.J. Killian <i>et al.</i>	(CORN)
COSME	76	PL 63B 352	G. Cosme <i>et al.</i>	(ORSAY)
BINGHAM	72B	PL 41B 635	H.H. Bingham <i>et al.</i>	(LBL, UCB, SLAC)
FRENKIEL	72	NP B47 61	P. Frenkiel <i>et al.</i>	(CDEF, CERN)
LAYSSAC	71	NC 6A 134	J. Layssac, F.M. Renard	(MONP)
