

Reference = ACHASOV 16B; PR D94 092002
Verifier code = DRUZHININ

PLEASE READ NOW

*PLEASE
REPLY
WITHIN
ONE WEEK*

Normally we send all verifications for one experiment to one person, usually the spokesperson or data-analysis coordinator, who then distributes them to the appropriate people. Please tell us if we should send the verifications for your experiment to someone else.

Vladimir P. Druzhinin

EMAIL: v.p.druzhinin@inp.nsk.su

March 20, 2017

Dear Colleague,

- (1) Please check the results of your experiment carefully. They are marked.
- (2) Please reply within one week.
- (3) Please reply even if everything is correct.
- (4) IMPORTANT!! Please tell WHICH papers you are verifying. We have lots of requests out.
- (5) Feel free to make comments on our treatment of any of the results (not just yours) you see.

Thank you for helping us make the Review accurate and useful.

Sincerely,

Simon Eidelman
BINP, Budker Inst. of Nuclear Physics
Prospekt Lavrent'eva 11
RU-630090 Novosibirsk
Russian Federation

EMAIL: simon.eidelman@cern.ch

LIGHT UNFLAVORED MESONS

($S = C = B = 0$)

For $I = 1$ (π, b, ρ, a): $u\bar{d}, (u\bar{u}-d\bar{d})/\sqrt{2}, d\bar{u}$;
for $I = 0$ ($\eta, \eta', h, h', \omega, \phi, f, f'$): $c_1(u\bar{u} + d\bar{d}) + c_2(s\bar{s})$

$\omega(1420)$

$$I^G(J^{PC}) = 0^-(1^{--})$$

$\omega(1420) \Gamma(i) \Gamma(e^+ e^-) / \Gamma^2(\text{total})$

$\Gamma(\omega\eta) / \Gamma_{\text{total}} \times \Gamma(e^+ e^-) / \Gamma_{\text{total}} \quad \Gamma_3 / \Gamma \times \Gamma_5 / \Gamma$

VALUE (units 10^{-8}) EVTS DOCUMENT ID TECN COMMENT

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

YOUR DATA $1.6^{+0.9}_{-0.7}$ 898 24 ACHASOV 16B SND $1.34-2.00 e^+ e^- \rightarrow \omega\eta$

YOUR NOTE 24 From a fit with contributions from $\omega(1420)$, $\omega(1650)$, and $\phi(1680)$. The mass and the width of $\omega(1420)$ are fixed to the 2014 edition (PDG 14) of this review.

$\omega(1420)$ REFERENCES

YOUR PAPER ACHASOV 16B PR D94 092002 M.N. Achasov *et al.* (SND Collab.)
PDG 14 CP C38 070001 K. Olive *et al.* (PDG Collab.)

$\omega(1650)$

$$I^G(J^{PC}) = 0^-(1^{--})$$

$\omega(1650)$ MASS

VALUE (MeV) EVTS DOCUMENT ID TECN COMMENT

1670 ± 30 OUR ESTIMATE

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

YOUR DATA	1660 ± 10	898	1 ACHASOV	16B SND	$1.34-2.00 e^+ e^- \rightarrow \omega\eta$
	1680 ± 10	13.1k	2 AULCHENKO	15A SND	$1.05-1.80 e^+ e^- \rightarrow \pi^+ \pi^- \pi^0$
	1667 ± 13 ± 6		AUBERT	07AU BABR	$10.6 e^+ e^- \rightarrow \omega \pi^+ \pi^- \gamma$
	1645 ± 8	13	AUBERT	06D BABR	$10.6 e^+ e^- \rightarrow \omega \eta \gamma$
	1660 ± 10 ± 2		AUBERT,B	04N BABR	$10.6 e^+ e^- \rightarrow \pi^+ \pi^- \pi^0 \gamma$
	1770 ± 50 ± 60	1.2M	3 ACHASOV	03D RVUE	$0.44-2.00 e^+ e^- \rightarrow \pi^+ \pi^- \pi^0$
	1619 ± 5		4 HENNER	02 RVUE	$1.2-2.0 e^+ e^- \rightarrow \rho \pi,$
	1700 ± 20		EUGENIO	01 SPEC	$18 \pi^- p \rightarrow \omega \eta n$
	1705 ± 26	612	5 AKHMETSHIN	00D CMD2	$e^+ e^- \rightarrow \omega \pi^+ \pi^-$
	1820^{+190}_{-150}		6 ACHASOV	98H RVUE	$e^+ e^- \rightarrow \pi^+ \pi^- \pi^0$
	1840^{+100}_{-70}		7 ACHASOV	98H RVUE	$e^+ e^- \rightarrow \omega \pi^+ \pi^-$
	1780^{+170}_{-300}		8 ACHASOV	98H RVUE	$e^+ e^- \rightarrow K^+ K^-$
~ 2100			9 ACHASOV	98H RVUE	$e^+ e^- \rightarrow K_S^0 K^\pm \pi^\mp$
	1606 ± 9		10 CLEGG	94 RVUE	
	1662 ± 13	750	11 ANTONELLI	92 DM2	$1.34-2.4 e^+ e^- \rightarrow \rho \pi,$
	1670 ± 20		ATKINSON	83B OMEG	$20-70 \gamma p \rightarrow 3\pi X$
	1657 ± 13		CORDIER	81 DM1	$e^+ e^- \rightarrow \omega 2\pi$
	1679 ± 34	21	ESPOSITO	80 FRAM	$e^+ e^- \rightarrow 3\pi$
	1652 ± 17		COSME	79 OSPK	$e^+ e^- \rightarrow 3\pi$

NODE=MXXX005

NODE=MXXX005

NODE=M125

NODE=M125230

NODE=M125G6
NODE=M125G6

NODE=M125G6;LINKAGE=A

NODE=M125

REFID=57537
REFID=55687
NODE=M126

NODE=M126M

NODE=M126M
→ UNCHECKED ←

OCCUR=2

OCCUR=2

OCCUR=3

OCCUR=4

OCCUR=5

OCCUR=4

YOUR NOTE

- ¹ From a fit with contributions from $\omega(1420)$, $\omega(1650)$, and $\phi(1680)$.
- ² From a fit with contributions from $\omega(782)$, $\phi(1020)$, $\omega(1420)$, and $\omega(1650)$.
- ³ From the combined fit of ANTONELLI 92, ACHASOV 01E, ACHASOV 02E, and ACHASOV 03D data on the $\pi^+\pi^-\pi^0$ and ANTONELLI 92 on the $\omega\pi^+\pi^-$ final states. Supersedes ACHASOV 99E and ACHASOV 02E.
- ⁴ Using results of CORDIER 81 and preliminary data of DOLINSKY 91 and ANTONELLI 92.
- ⁵ Using the data of AKHMETSHIN 00D and ANTONELLI 92. The $\rho\pi$ dominance for the energy dependence of the $\omega(1420)$ and $\omega(1650)$ width assumed.
- ⁶ Using data from BARKOV 87, DOLINSKY 91, and ANTONELLI 92.
- ⁷ Using the data from ANTONELLI 92.
- ⁸ Using the data from IVANOV 81 and BISELLO 88B.
- ⁹ Using the data from BISELLO 91C.
- ¹⁰ From a fit to two Breit-Wigner functions and using the data of DOLINSKY 91 and ANTONELLI 92.
- ¹¹ From the combined fit of the $\rho\pi$ and $\omega\pi\pi$ final states.

NODE=M126M;LINKAGE=E
 NODE=M126M;LINKAGE=A
 NODE=M126M;LINKAGE=VH

NODE=M126M;LINKAGE=AB

NODE=M126M;LINKAGE=KI

NODE=M126M;LINKAGE=L1
 NODE=M126M;LINKAGE=L2
 NODE=M126M;LINKAGE=L3
 NODE=M126M;LINKAGE=L4
 NODE=M126M;LINKAGE=AD

NODE=M126M;LINKAGE=AE

 $\omega(1650)$ WIDTH

VALUE (MeV) EVTS DOCUMENT ID TECN COMMENT
315± 35 OUR ESTIMATE

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

YOUR DATA

110± 20	898	¹² ACHASOV	16B	SND	1.34–2.00 $e^+e^- \rightarrow \omega\eta$
310± 30	13.1k	¹³ AULCHENKO	15A	SND	1.05–1.80 $e^+e^- \rightarrow \pi^+\pi^-\pi^0$
222± 25± 20		AUBERT	07AU	BABR	10.6 $e^+e^- \rightarrow \omega\pi^+\pi^-\gamma$
114± 14	13	AUBERT	06D	BABR	10.6 $e^+e^- \rightarrow \omega\eta\gamma$
230± 30± 20		AUBERT,B	04N	BABR	10.6 $e^+e^- \rightarrow \pi^+\pi^-\pi^0\gamma$
490 ⁺²⁰⁰ ₋₁₅₀ ±130	1.2M	¹⁴ ACHASOV	03D	RVUE	0.44–2.00 $e^+e^- \rightarrow \pi^+\pi^-\pi^0$
250± 14		¹⁵ HENNER	02	RVUE	1.2–2.0 $e^+e^- \rightarrow \rho\pi, \omega\pi\pi$
250± 50		EUGENIO	01	SPEC	18 $\pi^-p \rightarrow \omega\eta n$
370± 25	612	¹⁶ AKHMETSHIN 00D	CMD2		$e^+e^- \rightarrow \omega\pi^+\pi^-$
113± 20		¹⁷ CLEGG	94	RVUE	
280± 24	750	¹⁸ ANTONELLI 92	DM2		1.34–2.4 $e^+e^- \rightarrow \rho\pi, \omega\pi\pi$
160± 20		ATKINSON	83B	OMEG	20–70 $\gamma p \rightarrow 3\pi X$
136± 46		CORDIER	81	DM1	$e^+e^- \rightarrow \omega 2\pi$
99± 49	21	ESPOSITO	80	FRAM	$e^+e^- \rightarrow 3\pi$
42± 17		COSME	79	OSPK	$e^+e^- \rightarrow 3\pi$

NODE=M126W

NODE=M126W
 → UNCHECKED ←

OCCUR=2
 OCCUR=5
 OCCUR=4

YOUR NOTE

- ¹² From a fit with contributions from $\omega(1420)$, $\omega(1650)$, and $\phi(1680)$.
- ¹³ From a fit with contributions from $\omega(782)$, $\phi(1020)$, $\omega(1420)$, and $\omega(1650)$.
- ¹⁴ From the combined fit of ANTONELLI 92, ACHASOV 01E, ACHASOV 02E, and ACHASOV 03D data on the $\pi^+\pi^-\pi^0$ and ANTONELLI 92 on the $\omega\pi^+\pi^-$ final states. Supersedes ACHASOV 99E and ACHASOV 02E.
- ¹⁵ Using results of CORDIER 81 and preliminary data of DOLINSKY 91 and ANTONELLI 92.
- ¹⁶ Using the data of AKHMETSHIN 00D and ANTONELLI 92. The $\rho\pi$ dominance for the energy dependence of the $\omega(1420)$ and $\omega(1650)$ width assumed.
- ¹⁷ From a fit to two Breit-Wigner functions and using the data of DOLINSKY 91 and ANTONELLI 92.
- ¹⁸ From the combined fit of the $\rho\pi$ and $\omega\pi\pi$ final states.

NODE=M126W;LINKAGE=E
 NODE=M126W;LINKAGE=A
 NODE=M126W;LINKAGE=VH

NODE=M126W;LINKAGE=AB

NODE=M126W;LINKAGE=KI

NODE=M126W;LINKAGE=AD

NODE=M126W;LINKAGE=AE

 $\omega(1650) \Gamma(i)\Gamma(e^+e^-)/\Gamma^2(\text{total})$

$\Gamma(\omega\eta)/\Gamma_{\text{total}} \times \Gamma(e^+e^-)/\Gamma_{\text{total}}$ $\Gamma_3/\Gamma \times \Gamma_4/\Gamma$
 VALUE (units 10^{-6}) CL% EVTS DOCUMENT ID TECN COMMENT

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

YOUR DATA

0.44±0.05	898	¹⁹ ACHASOV	16B	SND	1.34–2.00 $e^+e^- \rightarrow \omega\eta$
0.57±0.06	13	AUBERT	06D	BABR	10.6 $e^+e^- \rightarrow \omega\eta\gamma$
<6	90	²⁸ AKHMETSHIN 03B	CMD2		$e^+e^- \rightarrow \eta\pi^0\gamma$

ERROR=7

YOUR NOTE

- ¹⁹ From a fit with contributions from $\omega(1420)$, $\omega(1650)$, and $\phi(1680)$.
- ²⁸ $\omega(1650)$ mass and width fixed at 1700 MeV and 250 MeV, respectively.

NODE=M126G5;LINKAGE=A
 NODE=M126G5;LINKAGE=KH

$\omega(1650)$ REFERENCES

NODE=M126

YOUR PAPER	ACHASOV	16B	PR D94 092002	M.N. Achasov <i>et al.</i>	(SND Collab.)	REFID=57537
	AULCHENKO	15A	JETP 121 27	V.M. Aulchenko <i>et al.</i>	(SND Collab.)	REFID=56843
			Translated from ZETF 148 34.			
	AUBERT	07AU	PR D76 092005	B. Aubert <i>et al.</i>	(BABAR Collab.)	REFID=52049
	AUBERT	06D	PR D73 052003	B. Aubert <i>et al.</i>	(BABAR Collab.)	REFID=51047
	AUBERT,B	04N	PR D70 072004	B. Aubert <i>et al.</i>	(BABAR Collab.)	REFID=50184
	ACHASOV	03D	PR D68 052006	M.N. Achasov <i>et al.</i>	(Novosibirsk SND Collab.)	REFID=49577
	AKHMETSHIN	03B	PL B562 173	R.R. Akhmetshin <i>et al.</i>	(Novosibirsk CMD-2 Collab.)	REFID=49406
	ACHASOV	02E	PR D66 032001	M.N. Achasov <i>et al.</i>	(Novosibirsk SND Collab.)	REFID=48815
	HENNER	02	EPJ C26 3	V.K. Henner <i>et al.</i>		REFID=49177
	ACHASOV	01E	PR D63 072002	M.N. Achasov <i>et al.</i>	(Novosibirsk SND Collab.)	REFID=48311
	EUGENIO	01	PL B497 190	P. Eugenio <i>et al.</i>		REFID=48010
	AKHMETSHIN	00D	PL B489 125	R.R. Akhmetshin <i>et al.</i>	(Novosibirsk CMD-2 Collab.)	REFID=47935
	ACHASOV	99E	PL B462 365	M.N. Achasov <i>et al.</i>	(Novosibirsk SND Collab.)	REFID=47391
	ACHASOV	98H	PR D57 4334	N.N. Achasov, A.A. Kozhevnikov		REFID=46323
	CLEGG	94	ZPHY C62 455	A.B. Clegg, A. Donnachie	(LANC, MCHS)	REFID=44081
	ANTONELLI	92	ZPHY C56 15	A. Antonelli <i>et al.</i>	(DM2 Collab.)	REFID=43168
	BISELLO	91C	ZPHY C52 227	D. Bisello <i>et al.</i>	(DM2 Collab.)	REFID=41867
	DOLINSKY	91	PRPL 202 99	S.I. Dolinsky <i>et al.</i>	(NOVO)	REFID=41369
	BISELLO	88B	ZPHY C39 13	D. Bisello <i>et al.</i>	(PADO, CLER, FRAS+)	REFID=40581
	BARKOV	87	JETPL 46 164	L.M. Barkov <i>et al.</i>	(NOVO)	REFID=40280
			Translated from ZETFP 46 132.			
	ATKINSON	83B	PL 127B 132	M. Atkinson <i>et al.</i>	(BONN, CERN, GLAS+)	REFID=21502
	CORDIER	81	PL 106B 155	A. Cordier <i>et al.</i>	(ORSAY)	REFID=21586
	IVANOV	81	PL 107B 297	P.M. Ivanov <i>et al.</i>	(NOVO)	REFID=20553
	ESPOSITO	80	LNC 28 195	B. Esposito <i>et al.</i>	(FRAS, NAPL, PADO+)	REFID=21584
	COSME	79	NP B152 215	G. Cosme <i>et al.</i>	(IPN)	REFID=21475