$\omega(1650)$
was $\omega(1600)$

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

$\omega(1650)$ MASS

VALUE (MeV)	*EVTS*	*DOCUMENT ID*		*TECN*	*CHG*	*COMMENT*
1649± 24 OUR AVERAGE	Error includes scale factor of 2.3.					
1609± 20	315	[1] ANTONELLI	92	DM2		1.34–2.4 $e^+e^- \rightarrow \rho\pi$
1663± 12	435	[2] ANTONELLI	92	DM2		1.34–2.4 $e^+e^- \rightarrow \omega\pi\pi$
• • • We do not use the following data for averages, fits, limits, etc. • • •						
1700± 20		EUGENIO	01	SPEC		18 $\pi^- p \rightarrow \omega\eta n$
1652± 35		[3] AKHMETSHIN	00D	CMD2		$e^+e^- \rightarrow \omega\pi^+\pi^-$
1705± 26		[4] AKHMETSHIN	00D	CMD2		$e^+e^- \rightarrow \omega\pi^+\pi^-$
1643± 14		[5] ACHASOV	99E	RVUE		0.75–1.80 $e^+e^- \rightarrow \pi^+\pi^-\pi^0$
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		$e^+e^- \rightarrow K^0_S K^\pm\pi^\mp$
1600± 30		[1] CLEGG	94	RVUE		$e^+e^- \rightarrow \rho\pi$
1607± 10		[2] CLEGG	94	RVUE		$e^+e^- \rightarrow \omega\pi\pi$
1635± 35		[10] CLEGG	94	RVUE		$e^+e^- \rightarrow \rho\pi$
1625± 21		[10] CLEGG	94	RVUE		$e^+e^- \rightarrow \omega\pi\pi$
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	0	$e^+e^- \rightarrow 3\pi$

[1] From a two Breit-Wigner fit.
[2] From a single Breit-Wigner plus background fit.
[3] Using the data of AKHMETSHIN 00D and ANTONELLI 92. The energy-independent width of the $\omega(1420)$ and $\omega(1650)$ mesons assumed.
[4] 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.
[5] Using the data of DOLINSKY 91, ANTONELLI 92, AKHMETSHIN 98, and ACHASOV 99E. From a fit to two Breit-Wigner functions interfering between them and with the ω,ϕ tails with fixed (+,−,+) phases.
[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 single Breit-Wigner fit.

$\omega(1650)$ WIDTH

VALUE (MeV)	*EVTS*	*DOCUMENT ID*		*TECN*	*CHG*	*COMMENT*
220±35 OUR AVERAGE Error includes scale factor of 1.6.						
159±43	315	[11] ANTONELLI	92	DM2		1.34–2.4 $e^+e^- \to \rho\pi$
240±25	435	[12] ANTONELLI	92	DM2		1.34–2.4 $e^+e^- \to \omega\pi\pi$
• • • We do not use the following data for averages, fits, limits, etc. • • •						
250±50		EUGENIO	01	SPEC		18 $\pi^- p \to \omega\eta n$
284±31		[13] AKHMETSHIN	00D	CMD2		$e^+e^- \to \omega\pi^+\pi^-$
370±25		[14] AKHMETSHIN	00D	CMD2		$e^+e^- \to \omega\pi^+\pi^-$
272±29		[15] ACHASOV	99E	RVUE		0.75–1.80 $e^+e^- \to \pi^+\pi^-\pi^0$
140±50		[11] CLEGG	94	RVUE		$e^+e^- \to \rho\pi$
86±20		[12] CLEGG	94	RVUE		$e^+e^- \to \omega\pi\pi$
350±80		[16] CLEGG	94	RVUE		$e^+e^- \to \rho\pi$
401±63		[16] CLEGG	94	RVUE		$e^+e^- \to \omega\pi\pi$
160±20		ATKINSON	83B	OMEG		20–70 $\gamma p \to 3\pi X$
136±46		CORDIER	81	DM1		$e^+e^- \to \omega 2\pi$
99±49	21	ESPOSITO	80	FRAM		$e^+e^- \to 3\pi$
42±17		COSME	79	OSPK	0	$e^+e^- \to 3\pi$

[11] From a two Breit-Wigner fit.

[12] From a single Breit-Wigner plus background fit.

[13] Using the data of AKHMETSHIN 00D and ANTONELLI 92. The energy-independent width of the $\omega(1420)$ and $\omega(1650)$ mesons assumed.

[14] 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.

[15] Using the data of DOLINSKY 91, ANTONELLI 92, AKHMETSHIN 98, and ACHASOV 99E. From a fit to two Breit-Wigner functions interfering between them and with the ω,ϕ tails with fixed (+,−,+) phases.

[16] From a single Breit-Wigner fit.

$\omega(1650)$ DECAY MODES

	Mode	Fraction (Γ_i/Γ)
Γ_1	$\rho\pi$	seen
Γ_2	$\omega\pi\pi$	seen
Γ_3	$\omega\eta$	seen
Γ_4	e^+e^-	seen

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

$\Gamma(\rho\pi) \times \Gamma(e^+e^-)/\Gamma_{\text{total}}$ — $\Gamma_1\Gamma_4/\Gamma$

VALUE (eV)	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
134±14	435	[17] ANTONELLI	92	DM2	1.34–2.4 $e^+e^- \to$ hadrons

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

27± 7		[18] ACHASOV	99E	RVUE	0.75–1.80 $e^+e^- \rightarrow \pi^+\pi^-\pi^0$
93±27	315	ANTONELLI	92	DM2	1.34–2.4$e^+e^- \rightarrow \rho\pi$
96±35		DONNACHIE	89	RVUE	$e^+e^- \rightarrow \rho\pi$

[17] From a coupled fit of $\rho\pi$ and $\omega\pi\pi$ channels.

[18] Using the data of DOLINSKY 91, ANTONELLI 92, AKHMETSHIN 98, and ACHASOV 99E. From a fit to two Breit-Wigner functions interfering between them and with the ω,ϕ tails with fixed (+,−,+) phases.

$\Gamma(\omega\pi\pi) \times \Gamma(e^+e^-)/\Gamma_{total}$ — $\Gamma_2\Gamma_4/\Gamma$

VALUE (keV)	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
170±17	435	[19] ANTONELLI	92	DM2	1.34–2.4$e^+e^- \rightarrow$ hadrons
• • • We do not use the following data for averages, fits, limits, etc. • • •					
192±33		[20] AKHMETSHIN	00D	CMD2	$e^+e^- \rightarrow \omega\pi^+\pi^-$
200±36		[21] AKHMETSHIN	00D	CMD2	$e^+e^- \rightarrow \omega\pi^+\pi^-$
135±16	435	[22] ANTONELLI	92	DM2	1.34–2.4$e^+e^- \rightarrow \omega\pi\pi$
56±31		DONNACHIE	89	RVUE	$e^+e^- \rightarrow \omega 2\pi$

[19] From a coupled fit of $\rho\pi$ and $\omega\pi\pi$ channels.

[20] Using the data of AKHMETSHIN 00D and ANTONELLI 92. The energy-independent width of the ω(1420) and ω(1650) mesons assumed.

[21] Using the data of AKHMETSHIN 00D and ANTONELLI 92. The $\rho\pi$ dominance for the energy dependence of the ω(1420) and ω(1650) width assumed.

[22] From a single Breit-Wigner fit.

ω(1650) BRANCHING RATIOS

$\Gamma(\rho\pi)/\Gamma(\omega\pi\pi)$ — Γ_1/Γ_2

VALUE	*DOCUMENT ID*		*TECN*	*COMMENT*
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.17±0.05	[23] ACHASOV	99E	RVUE	0.75–1.80 $e^+e^- \rightarrow \pi^+\pi^-\pi^0$

[23] Using the data of DOLINSKY 91, ANTONELLI 92, AKHMETSHIN 98, and ACHASOV 99E. From a fit to two Breit-Wigner functions interfering between them and with the ω,ϕ tails with fixed (+,−,+) phases.

ω(1650) REFERENCES

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AKHMETSHIN	00D	PL B489 125	R.R. Akhmetshin *et al.*	(Novosibirsk CMD-2 Collab.)
ACHASOV	99E	PL B462 365	M.N. Achasov *et al.*	(Novosibirsk SND Collab.)
ACHASOV	98H	PR D57 4334	N.N. Achasov, A.A. Kozhevnikov	
AKHMETSHIN	98	PL B434 426	R.R. Akhmetshin *et al.*	
CLEGG	94	ZPHY C62 455	A.B. Clegg, A. Donnachie	(LANC, MCHS)
ANTONELLI	92	ZPHY C56 15	A. Antonelli *et al.*	(DM2 Collab.)
BISELLO	91C	ZPHY C52 227	D. Bisello *et al.*	(DM2 Collab.)
DOLINSKY	91	PRPL 202 99	S.I. Dolinsky *et al.*	(NOVO)
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