$\omega(1420)$

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

$\omega(1420)$ MASS

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	COMMENT
(1400–1450) OUR ESTIMATE					
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$1490 \pm 50 \pm 25$	6.5k	[1] ACHASOV	02E	RVUE	0.98–2.00 $e^+ e^- \rightarrow \pi^+ \pi^- \pi^0$
1450 ± 10		[2] HENNER	02	RVUE	1.2–2.0 $e^+ e^- \rightarrow \rho\pi, \omega\pi\pi$
1373 ± 70	177	[3] AKHMETSHIN	00D	CMD2	1.2–1.38 $e^+ e^- \rightarrow \omega\pi^+\pi^-$
1370 ± 25	5095	ANISOVICH	00H	SPEC	0.0 $p\overline{p} \rightarrow \omega\pi^0\pi^0\pi^0$
1400^{+100}_{-200}		[4] ACHASOV	98H	RVUE	$e^+ e^- \rightarrow \pi^+\pi^-\pi^0$
~ 1400		[5] ACHASOV	98H	RVUE	$e^+ e^- \rightarrow \omega\pi^+\pi^-$
~ 1460		[6] ACHASOV	98H	RVUE	$e^+ e^- \rightarrow K^+ K^-$
1440 ± 70		[7] CLEGG	94	RVUE	
1419 ± 31	315	[8] ANTONELLI	92	DM2	1.34–2.4 $e^+ e^- \rightarrow \rho\pi$

[1] From the combined fit of ANTONELLI 92, ACHASOV 01E, and ACHASOV 02E data on the $\pi^+\pi^-\pi^0$ and ANTONELLI 92 on the $\omega\pi^+\pi^-$ final states. Supersedes ACHASOV 99E.

[2] Using results of CORDIER 81 and preliminary data of DOLINSKY 91 and ANTONELLI 92.

[3] 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.

[4] Using data from BARKOV 87, DOLINSKY 91, and ANTONELLI 92.

[5] Using the data from ANTONELLI 92.

[6] Using the data from IVANOV 81 and BISELLO 88B.

[7] From a fit to two Breit-Wigner functions and using the data of DOLINSKY 91 and ANTONELLI 92.

[8] From a fit to two Breit-Wigner functions interfering between them and with the ω,ϕ tails with fixed (+,−,+) phases.

$\omega(1420)$ WIDTH

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	COMMENT
(180–250) OUR ESTIMATE					
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$1210^{+300}_{-200} \pm 170$	6.5k	[9] ACHASOV	02E	RVUE	0.98–2.00 $e^+ e^- \rightarrow \pi^+ \pi^- \pi^0$
199 ± 15		[10] HENNER	02	RVUE	1.2–2.0 $e^+ e^- \rightarrow \rho\pi, \omega\pi\pi$
188 ± 45	177	[11] AKHMETSHIN	00D	CMD2	1.2–1.38 $e^+ e^- \rightarrow \omega\pi^+\pi^-$
360^{+100}_{-60}	5095	ANISOVICH	00H	SPEC	0.0 $p\overline{p} \rightarrow \omega\pi^0\pi^0\pi^0$
240 ± 70		[12] CLEGG	94	RVUE	
174 ± 59	315	[13] ANTONELLI	92	DM2	1.34–2.4 $e^+ e^- \rightarrow \rho\pi$

[9] From the combined fit of ANTONELLI 92, ACHASOV 01E, and ACHASOV 02E data on the $\pi^+\pi^-\pi^0$ and ANTONELLI 92 on the $\omega\pi^+\pi^-$ final states. Supersedes ACHASOV 99E.

[10] Using results of CORDIER 81 and preliminary data of DOLINSKY 91 and ANTONELLI 92.

[11] 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.

[12] From a fit to two Breit-Wigner functions and using the data of DOLINSKY 91 and ANTONELLI 92.

[13] From a fit to two Breit-Wigner functions interfering between them and with the ω,ϕ tails with fixed (+,−,+) phases.

$\omega(1420)$ DECAY MODES

	Mode	Fraction (Γ_i/Γ)
Γ_1	$\rho\pi$	dominant
Γ_2	$\omega\pi\pi$	possibly seen
Γ_3	$b_1(1235)\pi$	seen
Γ_4	e^+e^-	

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

$\Gamma(\rho\pi) \times \Gamma(e^+e^-)/\Gamma^2_{\text{total}}$ — $\Gamma_1\Gamma_4/\Gamma^2$

VALUE (units 10^{-6})	*DOCUMENT ID*		*TECN*	*COMMENT*
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$0.529\pm0.076\pm0.030$	[15,16] ACHASOV	02E	RVUE	0.98–2.00 $e^+e^- \rightarrow \pi^+\pi^-\pi^0$, $\omega\pi^+\pi^-$
0.625 ± 0.160	[17,18] CLEGG	94	RVUE	
0.466 ± 0.178	[19,20] ANTONELLI	92	DM2	1.34–2.4 $e^+e^- \rightarrow \rho\pi$

$\Gamma(\omega\pi\pi) \times \Gamma(e^+e^-)/\Gamma^2_{\text{total}}$ — $\Gamma_2\Gamma_4/\Gamma^2$

VALUE (units 10^{-8})	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$0.68^{+2.04}_{-0.68}\pm0.23$		[15,16] ACHASOV	02E	RVUE	0.98–2.00 $e^+e^- \rightarrow \pi^+\pi^-\pi^0$, $\omega\pi^+\pi^-$
1.3 ± 1.3	612	[14] AKHMETSHIN	00D	CMD2	1.2–2.4 $e^+e^- \rightarrow \omega\pi^+\pi^-$

[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] Calculated by us from the cross section at the peak.

[16] From the combined fit of ANTONELLI 92, ACHASOV 01E, and ACHASOV 02E data on the $\pi^+\pi^-\pi^0$ and ANTONELLI 92 on the $\omega\pi^+\pi^-$ final states. Supersedes ACHASOV 99E.

[17] From a fit to two Breit-Wigner functions and using the data of DOLINSKY 91 and ANTONELLI 92.

[18] From the partial and leptonic width given by the authors.

[19] From a fit to two Breit-Wigner functions interfering between them and with the ω,ϕ tails with fixed (+,−,+) phases.

[20] From the product of the leptonic width and partial branching ratio given by the authors.

$\omega(1420)$ BRANCHING RATIOS

$\Gamma(\omega\pi\pi)/\Gamma_{total}$ — Γ_2/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
≈ 0.01	[21] ACHASOV	02E	RVUE	0.98–2.00 $e^+e^- \rightarrow \pi^+\pi^-\pi^0$, $\omega\pi^+\pi^-$
0.301 ± 0.029	[22] HENNER	02	RVUE	1.2–2.0 $e^+e^- \rightarrow \rho\pi$, $\omega\pi\pi$
possibly seen	AKHMETSHIN	00D	CMD2	$e^+e^- \rightarrow \omega\pi^+\pi^-$

$\Gamma(\omega\pi\pi)/\Gamma(b_1(1235)\pi)$ — Γ_2/Γ_3

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.60 ± 0.16	5095	ANISOVICH	00H	SPEC	0.0 $p\overline{p} \rightarrow \omega\pi^0\pi^0\pi^0$

$\Gamma(\rho\pi)/\Gamma_{total}$ — Γ_1/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
≈ 0.99	[21] ACHASOV	02E	RVUE	0.98–2.00 $e^+e^- \rightarrow \pi^+\pi^-\pi^0$, $\omega\pi^+\pi^-$
0.699 ± 0.029	[22] HENNER	02	RVUE	1.2–2.0 $e^+e^- \rightarrow \rho\pi$, $\omega\pi\pi$

$\Gamma(e^+e^-)/\Gamma_{total}$ — Γ_4/Γ

VALUE (units 10^{-7})	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
23 ± 1	[22] HENNER	02	RVUE	1.2–2.0 $e^+e^- \rightarrow \rho\pi$, $\omega\pi\pi$

[21] From the combined fit of ANTONELLI 92, ACHASOV 01E, and ACHASOV 02E data on the $\pi^+\pi^-\pi^0$ and ANTONELLI 92 on the $\omega\pi^+\pi^-$ final states. Supersedes ACHASOV 99E.

[22] Assuming that the $\omega(1420)$ decays into $\rho\pi$ and $\omega\pi\pi$ only.

$\omega(1420)$ REFERENCES

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