

**$\omega(1420)$**

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

**$\omega(1420)$  MASS**

<u>VALUE (MeV)</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>(1400–1450) OUR ESTIMATE</b>				
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●				
1350 ± 20 ± 20		AUBERT,B	04N BABR	10.6 $e^+e^- \rightarrow \pi^+\pi^-\pi^0\gamma$
1400 ± 50 ± 130	1.2M	<sup>1</sup> ACHASOV	03D RVUE	0.44–2.00 $e^+e^- \rightarrow \pi^+\pi^-\pi^0$
1450 ± 10		<sup>2</sup> HENNER	02 RVUE	1.2–2.0 $e^+e^- \rightarrow \rho\pi,$
1373 ± 70	177	<sup>3</sup> AKHMETSHIN	00D CMD2	$\omega\pi\pi$ 1.2–1.38 $e^+e^- \rightarrow$
1370 ± 25	5095	ANISOVICH	00H SPEC	0.0 $\rho\bar{p} \rightarrow \omega\pi^0\pi^0\pi^0$
1400 <sup>+100</sup> <sub>–200</sub>		<sup>4</sup> ACHASOV	98H RVUE	$e^+e^- \rightarrow \pi^+\pi^-\pi^0$
~ 1400		<sup>5</sup> ACHASOV	98H RVUE	$e^+e^- \rightarrow \omega\pi^+\pi^-$
~ 1460		<sup>6</sup> ACHASOV	98H RVUE	$e^+e^- \rightarrow K^+K^-$
1440 ± 70		<sup>7</sup> CLEGG	94 RVUE	
1419 ± 31	315	<sup>8</sup> ANTONELLI	92 DM2	1.34–2.4 $e^+e^- \rightarrow \rho\pi$

<sup>1</sup>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.

<sup>2</sup>Using results of CORDIER 81 and preliminary data of DOLINSKY 91 and ANTONELLI 92.

<sup>3</sup>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.

<sup>4</sup>Using data from BARKOV 87, DOLINSKY 91, and ANTONELLI 92.

<sup>5</sup>Using the data from ANTONELLI 92.

<sup>6</sup>Using the data from IVANOV 81 and BISELLO 88B.

<sup>7</sup>From a fit to two Breit-Wigner functions and using the data of DOLINSKY 91 and ANTONELLI 92.

<sup>8</sup>From a fit to two Breit-Wigner functions interfering between them and with the  $\omega,\phi$  tails with fixed (+,–,+) phases.

**$\omega(1420)$  WIDTH**

<u>VALUE (MeV)</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>(180–250) OUR ESTIMATE</b>				
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●				
450 ± 70 ± 70		AUBERT,B	04N BABR	10.6 $e^+e^- \rightarrow \pi^+\pi^-\pi^0\gamma$
870 <sup>+500</sup> <sub>–300</sub> ± 450	1.2M	<sup>9</sup> ACHASOV	03D RVUE	0.44–2.00 $e^+e^- \rightarrow \pi^+\pi^-\pi^0$
199 ± 15		<sup>10</sup> HENNER	02 RVUE	1.2–2.0 $e^+e^- \rightarrow \rho\pi,$
188 ± 45	177	<sup>11</sup> AKHMETSHIN	00D CMD2	$\omega\pi\pi$ 1.2–1.38 $e^+e^- \rightarrow$
360 <sup>+100</sup> <sub>–60</sub>	5095	ANISOVICH	00H SPEC	0.0 $\rho\bar{p} \rightarrow \omega\pi^0\pi^0\pi^0$
240 ± 70		<sup>12</sup> CLEGG	94 RVUE	
174 ± 59	315	<sup>13</sup> ANTONELLI	92 DM2	1.34–2.4 $e^+e^- \rightarrow \rho\pi$

- <sup>9</sup> 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.
- <sup>10</sup> Using results of CORDIER 81 and preliminary data of DOLINSKY 91 and ANTONELLI 92.
- <sup>11</sup> 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.
- <sup>12</sup> From a fit to two Breit-Wigner functions and using the data of DOLINSKY 91 and ANTONELLI 92.
- <sup>13</sup> From a fit to two Breit-Wigner functions interfering between them and with the  $\omega, \phi$  tails with fixed (+, -, +) phases.

### $\omega(1420)$ DECAY MODES

Mode	Fraction ( $\Gamma_i/\Gamma$ )
$\Gamma_1$ $\rho\pi$	dominant
$\Gamma_2$ $\omega\pi\pi$	seen
$\Gamma_3$ $b_1(1235)\pi$	seen
$\Gamma_4$ $e^+e^-$	seen
$\Gamma_5$ $\pi^0\gamma$	

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

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

VALUE (units $10^{-6}$ )	EVTS	DOCUMENT ID	TECN	COMMENT
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• • • We do not use the following data for averages, fits, limits, etc. • • •

$0.82 \pm 0.05 \pm 0.06$		AUBERT,B	04N BABR	$10.6 e^+e^- \rightarrow \pi^+\pi^-\pi^0\gamma$
$0.65 \pm 0.13 \pm 0.21$	1.2M	<sup>14,15</sup> ACHASOV	03D RVUE	$0.44-2.00 e^+e^- \rightarrow \pi^+\pi^-\pi^0$
$0.625 \pm 0.160$		<sup>16,17</sup> CLEGG	94 RVUE	
$0.466 \pm 0.178$		<sup>18,19</sup> ANTONELLI	92 DM2	$1.34-2.4 e^+e^- \rightarrow \rho\pi$

<sup>14</sup> Calculated by us from the cross section at the peak.

<sup>15</sup> 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.

<sup>16</sup> From a fit to two Breit-Wigner functions and using the data of DOLINSKY 91 and ANTONELLI 92.

<sup>17</sup> From the partial and leptonic width given by the authors.

<sup>18</sup> From a fit to two Breit-Wigner functions interfering between them and with the  $\omega, \phi$  tails with fixed (+, -, +) phases.

<sup>19</sup> From the product of the leptonic width and partial branching ratio given by the authors.

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

VALUE (units $10^{-8}$ )	EVTS	DOCUMENT ID	TECN	COMMENT
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• • • We do not use the following data for averages, fits, limits, etc. • • •

$1.3 \pm 1.3$	612	<sup>20</sup> AKHMETSHIN 00D	CMD2	$1.2-2.4 e^+e^- \rightarrow \omega\pi^+\pi^-$
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<sup>20</sup> 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.

$\Gamma(\pi^0\gamma) \times \Gamma(e^+e^-)/\Gamma_{\text{total}}^2$   $\Gamma_5\Gamma_4/\Gamma^2$

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

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

$2.03^{+0.70}_{-0.75}$       <sup>21</sup> AKHMETSHIN 05    CMD2     $0.60-1.38 e^+e^- \rightarrow \pi^0\gamma$

<sup>21</sup> Using 1420 MeV and 220 MeV for the  $\omega(1420)$  mass and width.

$\omega(1420)$  BRANCHING RATIOS

$\Gamma(\omega\pi\pi)/\Gamma_{\text{total}}$   $\Gamma_2/\Gamma$

VALUE      DOCUMENT ID      TECN      COMMENT

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

$0.301 \pm 0.029$       <sup>23</sup> HENNER    02    RVUE     $1.2-2.0 e^+e^- \rightarrow \rho\pi,$   
possibly seen      AKHMETSHIN 00D    CMD2     $e^+e^- \rightarrow \omega\pi^+\pi^-$

$\Gamma(\omega\pi\pi)/\Gamma(b_1(1235)\pi)$   $\Gamma_2/\Gamma_3$

VALUE      EVTS      DOCUMENT ID      TECN      COMMENT

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

$0.60 \pm 0.16$       5095      ANISOVICH    00H    SPEC     $0.0 p\bar{p} \rightarrow \omega\pi^0\pi^0\pi^0$

$\Gamma(\rho\pi)/\Gamma_{\text{total}}$   $\Gamma_1/\Gamma$

VALUE      DOCUMENT ID      TECN      COMMENT

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

$0.699 \pm 0.029$       <sup>23</sup> HENNER    02    RVUE     $1.2-2.0 e^+e^- \rightarrow \rho\pi,$   
 $\omega\pi\pi$

$\Gamma(e^+e^-)/\Gamma_{\text{total}}$   $\Gamma_4/\Gamma$

VALUE (units  $10^{-7}$ )      EVTS      DOCUMENT ID      TECN      COMMENT

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

$\sim 6.6$       1.2M <sup>22,24</sup> ACHASOV    03D    RVUE     $0.44-2.00 e^+e^- \rightarrow \pi^+\pi^-\pi^0$   
 $23 \pm 1$       <sup>23</sup> HENNER    02    RVUE     $1.2-2.0 e^+e^- \rightarrow \rho\pi,$   
 $\omega\pi\pi$

<sup>22</sup> Assuming that the  $\omega(1420)$  decays into  $\rho\pi$  only.

<sup>23</sup> Assuming that the  $\omega(1420)$  decays into  $\rho\pi$  and  $\omega\pi\pi$  only.

<sup>24</sup> Calculated by us from the cross section at the peak.

$\omega(1420)$  REFERENCES

AKHMETSHIN 05	PL B605 26	R.R. Akhmetshin <i>et al.</i>	(Novosibirsk CMD-2 Collab.)
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AKHMETSHIN 00D	PL B489 125	R.R. Akhmetshin <i>et al.</i>	(Novosibirsk CMD-2 Collab.)
ANISOVICH 00H	PL B485 341	A.V. Anisovich <i>et al.</i>	
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