

# a<sub>1</sub>(1640)

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

Possibly seen in the study of the hadronic structure in decay  $\tau \rightarrow 3\pi\nu_\tau$  (ABREU 98G and ASNER 00).

## a<sub>1</sub>(1640) MASS

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
<b>1655 ± 16 OUR AVERAGE</b>		Error includes scale factor of 1.2.		
1700 <sup>+35</sup> <sub>-130</sub>	46M	<sup>1</sup> AGHASYAN	18B	COMP 190 $\pi^- p \rightarrow \pi^- \pi^+ \pi^- p$
1691 ± 18 ± 30		DARGENT	17	RVUE $D^0 \rightarrow \pi^- \pi^+ \pi^- \pi^+$
1630 ± 20	35k	<sup>2</sup> BAKER	03	SPEC $\bar{p} p \rightarrow \omega \pi^+ \pi^- \pi^0$
1714 ± 9 ± 36		CHUNG	02	B852 18.3 $\pi^- p \rightarrow \pi^+ \pi^- \pi^- p$
1640 ± 12 ± 30		BAKER	99	SPEC 1.94 $\bar{p} p \rightarrow 4\pi^0$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●				
1670 ± 90		BELLINI	85	SPEC 40 $\pi^- A \rightarrow \pi^- \pi^+ \pi^- A$

<sup>1</sup> Statistical error negligible.

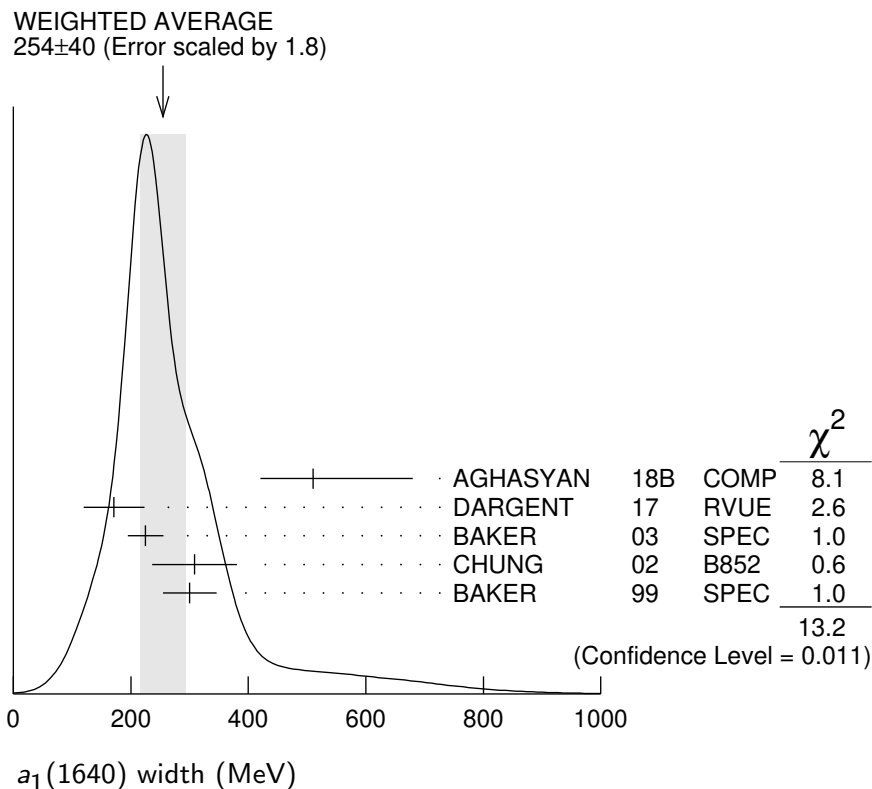
<sup>2</sup> Using the a<sub>1</sub>(1260) mass and width results of BOWLER 88.

## a<sub>1</sub>(1640) WIDTH

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
<b>254 ± 40 OUR AVERAGE</b>		Error includes scale factor of 1.8. See the ideogram below.		
510 <sup>+170</sup> <sub>-90</sub>	46M	<sup>1</sup> AGHASYAN	18B	COMP 190 $\pi^- p \rightarrow \pi^- \pi^+ \pi^- p$
171 ± 33 ± 40		DARGENT	17	RVUE $D^0 \rightarrow \pi^- \pi^+ \pi^- \pi^+$
225 ± 30	35k	<sup>2</sup> BAKER	03	SPEC $\bar{p} p \rightarrow \omega \pi^+ \pi^- \pi^0$
308 ± 37 ± 62		CHUNG	02	B852 18.3 $\pi^- p \rightarrow \pi^+ \pi^- \pi^- p$
300 ± 22 ± 40		BAKER	99	SPEC 1.94 $\bar{p} p \rightarrow 4\pi^0$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●				
300 ± 100		BELLINI	85	SPEC 40 $\pi^- A \rightarrow \pi^- \pi^+ \pi^- A$

<sup>1</sup> Statistical error negligible.

<sup>2</sup> Using the a<sub>1</sub>(1260) mass and width results of BOWLER 88.



### $a_1(1640)$ DECAY MODES

Mode	Fraction ( $\Gamma_i/\Gamma$ )
$\Gamma_1$ $\pi\pi\pi$	seen
$\Gamma_2$ $f_2(1270)\pi$	seen
$\Gamma_3$ $\sigma\pi$	seen
$\Gamma_4$ $\rho\pi$ <i>S-wave</i>	seen
$\Gamma_5$ $\rho\pi$ <i>D-wave</i>	seen
$\Gamma_6$ $\omega\pi\pi$	seen
$\Gamma_7$ $f_1(1285)\pi$	seen
$\Gamma_8$ $a_1(1260)\eta$	not seen

### $a_1(1640)$ BRANCHING RATIOS

$\Gamma(f_2(1270)\pi)/\Gamma(\sigma\pi)$	$\Gamma_2/\Gamma_3$
VALUE	DOCUMENT ID TECN COMMENT
<b>0.24±0.07</b>	BAKER 99 SPEC 1.94 $\bar{p}p \rightarrow 4\pi^0$

$\Gamma(\rho\pi$ <i>D-wave</i> )/ $\Gamma_{\text{total}}$	$\Gamma_5/\Gamma$
VALUE	DOCUMENT ID TECN COMMENT
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●	
seen	CHUNG 02 B852 18.3 $\pi^- p \rightarrow \pi^+ \pi^- \pi^- p$
seen	AMELIN 95B VES 36 $\pi^- A \rightarrow \pi^+ \pi^- \pi^- A$

$\Gamma(\omega\pi\pi)/\Gamma_{\text{total}}$   $\Gamma_6/\Gamma$

VALUE EVTS DOCUMENT ID TECN COMMENT

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

seen 35280 <sup>1</sup>BAKER 03 SPEC  $\bar{p}p \rightarrow \omega\pi^+\pi^-\pi^0$

<sup>1</sup> Assuming the  $\omega\rho$  mechanism for the  $\omega\pi\pi$  state.

$\Gamma(f_1(1285)\pi)/\Gamma_{\text{total}}$   $\Gamma_7/\Gamma$

VALUE DOCUMENT ID TECN COMMENT

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

not seen KUHN 04 B852  $18 \pi^- p \rightarrow \eta\pi^+\pi^-\pi^- p$

seen LEE 94 MPS2  $18 \pi^- p \rightarrow K^+\bar{K}^0\pi^-\pi^- p$

$\Gamma(a_1(1260)\eta)/\Gamma_{\text{total}}$   $\Gamma_8/\Gamma$

VALUE DOCUMENT ID TECN COMMENT

not seen KUHN 04 B852  $18 \pi^- p \rightarrow \eta\pi^+\pi^-\pi^- p$

**$a_1(1640)$  REFERENCES**

AGHASYAN	18B	PR D98 092003	M. Aghasyan <i>et al.</i>	(COMPASS Collab.)
DARGENT	17	JHEP 1705 143	P. dArgent <i>et al.</i>	(HEID, BRIS)
KUHN	04	PL B595 109	J. Kuhn <i>et al.</i>	(BNL E852 Collab.)
BAKER	03	PL B563 140	C.A. Baker <i>et al.</i>	
CHUNG	02	PR D65 072001	S.U. Chung <i>et al.</i>	(BNL E852 Collab.)
ASNER	00	PR D61 012002	D.M. Asner <i>et al.</i>	(CLEO Collab.)
BAKER	99	PL B449 114	C.A. Baker <i>et al.</i>	
ABREU	98G	PL B426 411	P. Abreu <i>et al.</i>	(DELPHI Collab.)
AMELIN	95B	PL B356 595	D.V. Amelin <i>et al.</i>	(SERP, TBIL)
LEE	94	PL B323 227	J.H. Lee <i>et al.</i>	(BNL, IND, KYUN, MASD+)
BOWLER	88	PL B209 99	M.G. Bowler	(OXF)
BELLINI	85	SJNP 41 781	D. Bellini <i>et al.</i>	

Translated from YAF 41 1223.