

**$a_4(2040)$** 

$$I^G(J^{PC}) = 1^-(4^{++})$$

 **$a_4(2040)$  MASS**

<u>VALUE (MeV)</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>CHG</u>	<u>COMMENT</u>
<b>2001 ± 10 OUR AVERAGE</b>					
1985 ± 10 ± 13	145k	LU	05	E852	18 $\pi^- p \rightarrow \omega \pi^- \pi^0 p$
1996 ± 25 ± 43		CHUNG	02	E852	18.3 $\pi^- p \rightarrow 3\pi p$
2000 ± 40 $^{+60}_{-20}$		IVANOV	01	E852	18 $\pi^- p \rightarrow \eta' \pi^- p$
1944 ± 8 ± 50		<sup>1</sup> AMELIN	99	VES	37 $\pi^- A \rightarrow \omega \pi^- \pi^0 A^*$
2005 ± 25		ANISOVICH	99E	SPEC	
2010 ± 20		<sup>2</sup> DONSKOV	96	GAM2 0	38 $\pi^- p \rightarrow \eta \pi^0 n$
2040 ± 30		<sup>3</sup> CLELAND	82B	SPEC ±	50 $\pi p \rightarrow K_S^0 K^\pm p$
2030 ± 50		<sup>4</sup> CORDEN	78C	OMEG 0	15 $\pi^- p \rightarrow 3\pi n$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
2005 $^{+25}_{-45}$		ANISOVICH	01F	SPEC	2.0 $\bar{p} p \rightarrow 3\pi^0, \pi^0 \eta, \pi^0 \eta'$
1903 ± 10		<sup>5</sup> BALDI	78	SPEC -	10 $\pi^- p \rightarrow p K_S^0 K^-$

<sup>1</sup> May be a different state.<sup>2</sup> From a simultaneous fit to the  $G_+$  and  $G_0$  wave intensities.<sup>3</sup> From an amplitude analysis.<sup>4</sup>  $J^P = 4^+$  is favored, though  $J^P = 2^+$  cannot be excluded.<sup>5</sup> From a fit to the  $Y_8^0$  moment. Limited by phase space. **$a_4(2040)$  WIDTH**

<u>VALUE (MeV)</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>CHG</u>	<u>COMMENT</u>
<b>313 ± 31 OUR AVERAGE</b>					
231 ± 30 ± 46	145k	LU	05	E852	18 $\pi^- p \rightarrow \omega \pi^- \pi^0 p$
298 ± 81 ± 85		CHUNG	02	E852	18.3 $\pi^- p \rightarrow 3\pi p$
350 ± 100 $^{+70}_{-50}$		IVANOV	01	E852	18 $\pi^- p \rightarrow \eta' \pi^- p$
324 ± 26 ± 75		<sup>6</sup> AMELIN	99	VES	37 $\pi^- A \rightarrow \omega \pi^- \pi^0 A^*$
360 ± 80		ANISOVICH	99E	SPEC	
370 ± 80		<sup>7</sup> DONSKOV	96	GAM2 0	38 $\pi^- p \rightarrow \eta \pi^0 n$
380 ± 150		<sup>8</sup> CLELAND	82B	SPEC ±	50 $\pi p \rightarrow K_S^0 K^\pm p$
510 ± 200		<sup>9</sup> CORDEN	78C	OMEG 0	15 $\pi^- p \rightarrow 3\pi n$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
180 ± 30		ANISOVICH	01F	SPEC	2.0 $\bar{p} p \rightarrow 3\pi^0, \pi^0 \eta, \pi^0 \eta'$
166 ± 43		<sup>10</sup> BALDI	78	SPEC -	10 $\pi^- p \rightarrow p K_S^0 K^-$

<sup>6</sup> May be a different state.

<sup>7</sup> From a simultaneous fit to the  $G_+$  and  $G_0$  wave intensities.

<sup>8</sup> From an amplitude analysis.

<sup>9</sup>  $J^P = 4^+$  is favored, though  $J^P = 2^+$  cannot be excluded.

<sup>10</sup> From a fit to the  $Y_8^0$  moment. Limited by phase space.

### $a_4(2040)$ DECAY MODES

Mode	Fraction ( $\Gamma_i/\Gamma$ )
$\Gamma_1$ $K\bar{K}$	seen
$\Gamma_2$ $\pi^+\pi^-\pi^0$	seen
$\Gamma_3$ $\rho\pi$	seen
$\Gamma_4$ $f_2(1270)\pi$	seen
$\Gamma_5$ $\omega\pi^-\pi^0$	seen
$\Gamma_6$ $\omega\rho$	seen
$\Gamma_7$ $\eta\pi^0$	seen
$\Gamma_8$ $\eta'(958)\pi$	seen

### $a_4(2040)$ BRANCHING RATIOS

$\Gamma(K\bar{K})/\Gamma_{\text{total}}$	$\Gamma_1/\Gamma$			
VALUE	DOCUMENT ID	TECN	CHG	COMMENT
seen	BALDI	78	SPEC	$\pm$ 10 $\pi^- p \rightarrow K_S^0 K^- p$

$\Gamma(\pi^+\pi^-\pi^0)/\Gamma_{\text{total}}$	$\Gamma_2/\Gamma$			
VALUE	DOCUMENT ID	TECN	CHG	COMMENT
seen	CORDEN	78c	OMEG	0 15 $\pi^- p \rightarrow 3\pi n$

$\Gamma(\rho\pi)/\Gamma(f_2(1270)\pi)$	$\Gamma_3/\Gamma_4$		
VALUE	DOCUMENT ID	TECN	COMMENT
$1.1 \pm 0.2 \pm 0.2$	CHUNG	02	E852 18.3 $\pi^- p \rightarrow 3\pi p$

$\Gamma(\eta\pi^0)/\Gamma_{\text{total}}$	$\Gamma_7/\Gamma$			
VALUE	DOCUMENT ID	TECN	CHG	COMMENT
seen	DONSKOV	96	GAM2	0 38 $\pi^- p \rightarrow \eta\pi^0 n$

$\Gamma(\omega\rho)/\Gamma_{\text{total}}$	$\Gamma_6/\Gamma$			
VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
seen	145k	LU	05	E852 18 $\pi^- p \rightarrow \omega\pi^-\pi^0 p$

## **$a_4(2040)$ REFERENCES**

LU	05	PRL 94 032002	M. Lu <i>et al.</i>	(BNL E852 Collab.)
CHUNG	02	PR D65 072001	S.U. Chung <i>et al.</i>	(BNL E852 Collab.)
ANISOVICH	01F	PL B517 261	A.V. Anisovich <i>et al.</i>	
IVANOV	01	PRL 86 3977	E.I. Ivanov <i>et al.</i>	(BNL E852 Collab.)
AMELIN	99	PAN 62 445	D.V. Amelin <i>et al.</i>	(VES Collab.)
		Translated from YAF 62	487.	
ANISOVICH	99E	PL B452 187	A.V. Anisovich <i>et al.</i>	
DONSKOV	96	PAN 59 982	S.V. Donskov <i>et al.</i>	(GAMS Collab.) IGJPC
		Translated from YAF 59	1027.	
CLELAND	82B	NP B208 228	W.E. Cleland <i>et al.</i>	(DURH, GEVA, LAUS+)
BALDI	78	PL 74B 413	R. Baldi <i>et al.</i>	(GEVA) JP
CORDEN	78C	NP B136 77	M.J. Corden <i>et al.</i>	(BIRM, RHEL, TELA+) JP

## ———— OTHER RELATED PAPERS ————

DELFOSSÉ	81	NP B183 349	A. Delfosse <i>et al.</i>	(GEVA, LAUS)
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