

a₄(2040)

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

a₄(2040) MASS

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	CHG	COMMENT
2001 ± 10 OUR AVERAGE					
1985 ± 10 ± 13	145k	LU	05	B852	18 $\pi^- p \rightarrow \omega \pi^- \pi^0 p$
1996 ± 25 ± 43		CHUNG	02	B852	18.3 $\pi^- p \rightarrow 3\pi p$
2000 ± 40 ⁺⁶⁰ ₋₂₀		IVANOV	01	B852	18 $\pi^- p \rightarrow \eta' \pi^- p$
1944 ± 8 ± 50		¹ AMELIN	99	VES	37 $\pi^- A \rightarrow \omega \pi^- \pi^0 A^*$
2005 ± 25		ANISOVICH	99E	SPEC	
2010 ± 20		² DONSKOV	96	GAM2 0	38 $\pi^- p \rightarrow \eta \pi^0 n$
2040 ± 30		³ CLELAND	82B	SPEC ±	50 $\pi p \rightarrow K_S^0 K^\pm p$
2030 ± 50		⁴ CORDEN	78C	OMEG 0	15 $\pi^- p \rightarrow 3\pi n$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●					
2004 ± 6	80k	⁵ UMAN	06	E835	5.2 $\bar{p} p \rightarrow \eta \eta \pi^0$
2005 ⁺²⁵ ₋₄₅		ANISOVICH	01F	SPEC	2.0 $\bar{p} p \rightarrow 3\pi^0, \pi^0 \eta, \pi^0 \eta'$
1903 ± 10		⁶ BALDI	78	SPEC -	10 $\pi^- p \rightarrow p K_S^0 K^-$

¹ May be a different state.

² From a simultaneous fit to the G_+ and G_0 wave intensities.

³ From an amplitude analysis.

⁴ $J^P = 4^+$ is favored, though $J^P = 2^+$ cannot be excluded.

⁵ Statistical error only.

⁶ From a fit to the Y_8^0 moment. Limited by phase space.

a₄(2040) WIDTH

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	CHG	COMMENT
313 ± 31 OUR AVERAGE					
231 ± 30 ± 46	145k	LU	05	B852	18 $\pi^- p \rightarrow \omega \pi^- \pi^0 p$
298 ± 81 ± 85		CHUNG	02	B852	18.3 $\pi^- p \rightarrow 3\pi p$
350 ± 100 ⁺⁷⁰ ₋₅₀		IVANOV	01	B852	18 $\pi^- p \rightarrow \eta' \pi^- p$
324 ± 26 ± 75		⁷ AMELIN	99	VES	37 $\pi^- A \rightarrow \omega \pi^- \pi^0 A^*$
360 ± 80		ANISOVICH	99E	SPEC	
370 ± 80		⁸ DONSKOV	96	GAM2 0	38 $\pi^- p \rightarrow \eta \pi^0 n$
380 ± 150		⁹ CLELAND	82B	SPEC ±	50 $\pi p \rightarrow K_S^0 K^\pm p$
510 ± 200		¹⁰ CORDEN	78C	OMEG 0	15 $\pi^- p \rightarrow 3\pi n$

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

401 ± 16	80k	¹¹ UMAN	06	E835	5.2 $\bar{p}p \rightarrow \eta\eta\pi^0$
180 ± 30		ANISOVICH	01F	SPEC	2.0 $\bar{p}p \rightarrow 3\pi^0, \pi^0\eta,$ $\pi^0\eta'$
166 ± 43		¹² BALDI	78	SPEC	– 10 $\pi^-p \rightarrow pK_S^0K^-$

⁷ May be a different state.

⁸ From a simultaneous fit to the G_+ and G_0 wave intensities.

⁹ From an amplitude analysis.

¹⁰ $J^P = 4^+$ is favored, though $J^P = 2^+$ cannot be excluded.

¹¹ Statistical error only.

¹² From a fit to the Y_8^0 moment. Limited by phase space.

$a_4(2040)$ DECAY MODES

Mode	Fraction (Γ_i/Γ)
Γ_1 $K\bar{K}$	seen
Γ_2 $\pi^+\pi^-\pi^0$	seen
Γ_3 $\rho\pi$	seen
Γ_4 $f_2(1270)\pi$	seen
Γ_5 $\omega\pi^-\pi^0$	seen
Γ_6 $\omega\rho$	seen
Γ_7 $\eta\pi^0$	seen
Γ_8 $\eta'(958)\pi$	seen

$a_4(2040)$ BRANCHING RATIOS

$\Gamma(K\bar{K})/\Gamma_{\text{total}}$	Γ_1/Γ			
VALUE	DOCUMENT ID	TECN	CHG	COMMENT
seen	BALDI	78	SPEC	± 10 $\pi^-p \rightarrow K_S^0K^-p$

$\Gamma(\pi^+\pi^-\pi^0)/\Gamma_{\text{total}}$	Γ_2/Γ			
VALUE	DOCUMENT ID	TECN	CHG	COMMENT
seen	CORDEN	78C	OMEG	0 15 $\pi^-p \rightarrow 3\pi n$

$\Gamma(\rho\pi)/\Gamma(f_2(1270)\pi)$	Γ_3/Γ_4		
VALUE	DOCUMENT ID	TECN	COMMENT
1.1 ± 0.2 ± 0.2	CHUNG	02	B852 18.3 $\pi^-p \rightarrow 3\pi p$

$\Gamma(\eta\pi^0)/\Gamma_{\text{total}}$	Γ_7/Γ			
VALUE	DOCUMENT ID	TECN	CHG	COMMENT
seen	DONSKOV	96	GAM2	0 38 $\pi^-p \rightarrow \eta\pi^0n$

$\Gamma(\omega\rho)/\Gamma_{\text{total}}$	Γ_6/Γ			
VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
seen	145k	LU	05	B852 18 $\pi^-p \rightarrow \omega\pi^-\pi^0p$

a_4 (2040) REFERENCES

UMAN	06	PR D73 052009	I. Uman <i>et al.</i>	(FNAL E835)
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

DZIERBA	06	PR D73 072001	A.R. Dzierba <i>et al.</i>	(BNL E852 Collab.)
DELFOSSSE	81	NP B183 349	A. Delfosse <i>et al.</i>	(GEVA, LAUS)
