$a_4(2040)$

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

$a_4(2040)$ MASS

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

[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] From a fit to the Y^0_8 moment. Limited by phase space.

$a_4(2040)$ WIDTH

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

[6] May be a different state.
[7] From a simultaneous fit to the G_+ and G_0 wave intensities.
[8] From an amplitude analysis.
[9] $J^P = 4^+$ is favored, though $J^P = 2^+$ cannot be excluded.
[10] 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	$K\overline{K}$	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

$\Gamma(K\overline{K})/\Gamma_{total}$ Γ_1/Γ

VALUE	DOCUMENT ID		TECN	CHG	COMMENT
seen	BALDI	78	SPEC	$\pm$	10 $\pi^- p \to K_S^0 K^- p$

$\Gamma(\pi^+\pi^-\pi^0)/\Gamma_{total}$ Γ_2/Γ

VALUE	DOCUMENT ID		TECN	CHG	COMMENT
seen	CORDEN	78C	OMEG	0	15 $\pi^- p \to 3\pi n$

$\Gamma(\rho\pi)/\Gamma(f_2(1270)\pi)$ Γ_3/Γ_4

VALUE	DOCUMENT ID		TECN	COMMENT
1.1±0.2 ±0.2	CHUNG	02	E852	18.3 $\pi^- p \to 3\pi p$

$\Gamma(\eta\pi^0)/\Gamma_{total}$ Γ_7/Γ

VALUE	DOCUMENT ID		TECN	CHG	COMMENT
seen	DONSKOV	96	GAM2	0	38 $\pi^- p \to \eta\pi^0 n$

$\Gamma(\omega\rho)/\Gamma_{total}$ Γ_6/Γ

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
seen	145k	LU	05	E852	18 $\pi^- p \to \omega\pi^-\pi^0 p$

$a_4(2040)$ REFERENCES

LU	05	PRL 94 032002	M. Lu *et al.*	(BNL E852 Collab.)
CHUNG	02	PR D65 072001	S.U. Chung *et al.*	(BNL E852 Collab.)
ANISOVICH	01F	PL B517 261	A.V. Anisovich *et al.*	
IVANOV	01	PRL 86 3977	E.I. Ivanov *et al.*	(BNL E852 Collab.)
AMELIN	99	PAN 62 445 Translated from YAF 62 487.	D.V. Amelin *et al.*	(VES Collab.)
ANISOVICH	99E	PL B452 187	A.V. Anisovich *et al.*	
DONSKOV	96	PAN 59 982 Translated from YAF 59 1027.	S.V. Donskov *et al.*	(GAMS Collab.) IGJPC
CLELAND	82B	NP B208 228	W.E. Cleland *et al.*	(DURH, GEVA, LAUS+)
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