

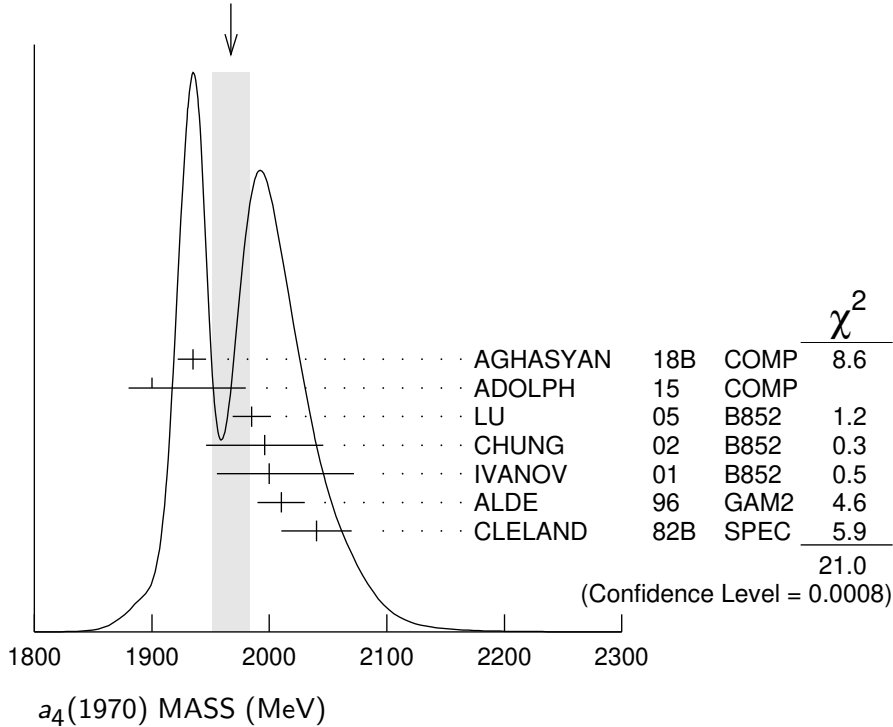
a₄(1970)

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

a₄(1970) MASS

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	CHG	COMMENT
1967±16 OUR AVERAGE Error includes scale factor of 2.1. See the ideogram below.					
1935 ⁺¹¹ ₋₁₃	46M	¹ AGHASYAN	18B	COMP	190 π ⁻ p → π ⁻ π ⁺ π ⁻ p
1900 ⁺⁸⁰ ₋₂₀		ADOLPH	15	COMP	191 π ⁻ p → η ^(l) π ⁻ p
1985±10±13	145k	LU	05	B852	18 π ⁻ p → ω π ⁻ π ⁰ p
1996±25±43		CHUNG	02	B852	18.3 π ⁻ p → 3π p
2000±40 ⁺⁶⁰ ₋₂₀		IVANOV	01	B852	18 π ⁻ p → η' π ⁻ p
2010±20		² ALDE	96	GAM2 0	38 π ⁻ p → η π ⁰ n
2040±30		³ CLELAND	82B	SPEC ±	50 π p → K _S ⁰ K [±] p
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●					
1885±13 ⁺⁵⁰ ₋₂	420k	⁴ ALEKSEEV	10	COMP	190 π ⁻ Pb → π ⁻ π ⁻ π ⁺ Pb'
2004± 6	80k	⁵ UMAN	06	E835	5.2 p̄ p → η η π ⁰
2005 ⁺²⁵ ₋₄₅		⁶ ANISOVICH	01F	SPEC	2.0 p̄ p → 3π ⁰ , π ⁰ η, π ⁰ η'
1944± 8±50		⁷ AMELIN	99	VES	37 π ⁻ A → ω π ⁻ π ⁰ A*
1903±10		⁸ BALDI	78	SPEC -	10 π ⁻ p → p K _S ⁰ K ⁻
2030±50		⁹ CORDEN	78C	OMEG 0	15 π ⁻ p → 3π n

WEIGHTED AVERAGE
1967±16 (Error scaled by 2.1)



- ¹ Statistical error negligible.
- ² From a simultaneous fit to the G_+ and G_0 wave intensities.
- ³ From an amplitude analysis.
- ⁴ Superseded by AGHASYAN 2018B.
- ⁵ Statistical error only.
- ⁶ From the combined analysis of ANISOVICH 99C, ANISOVICH 99E, and ANISOVICH 01F.
- ⁷ May be a different state.
- ⁸ From a fit to the Y_8^0 moment. Limited by phase space.
- ⁹ $J^P = 4^+$ is favored, though $J^P = 2^+$ cannot be excluded.

$a_4(1970)$ WIDTH

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	CHG	COMMENT
324⁺₋ 15⁺₋ 18 OUR AVERAGE					
333 ⁺ ₋ 16 ₂₁	46M	¹ AGHASYAN	18B	COMP	190 $\pi^- p \rightarrow \pi^- \pi^+ \pi^- p$
300 ⁺ ₋ 80 ₁₀₀		ADOLPH	15	COMP	191 $\pi^- p \rightarrow \eta^{(\prime)} \pi^- p$
231 \pm 30 \pm 46	145k	LU	05	B852	18 $\pi^- p \rightarrow \omega \pi^- \pi^0 p$
298 \pm 81 \pm 85		CHUNG	02	B852	18.3 $\pi^- p \rightarrow 3\pi p$
350 \pm 100 ⁺ ₋ 70 ₅₀		IVANOV	01	B852	18 $\pi^- p \rightarrow \eta' \pi^- p$
370 \pm 80		² ALDE	96	GAM2 0	38 $\pi^- p \rightarrow \eta \pi^0 n$
380 \pm 150		³ CLELAND	82B	SPEC \pm	50 $\pi p \rightarrow K_S^0 K^\pm p$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●					
294 \pm 25 ⁺ ₋ 46 ₁₉	420k	⁴ ALEKSEEV	10	COMP	190 $\pi^- Pb \rightarrow \pi^- \pi^- \pi^+ Pb'$
401 \pm 16	80k	⁵ UMAN	06	E835	5.2 $\bar{p} p \rightarrow \eta \eta \pi^0$
180 \pm 30		⁶ ANISOVICH	01F	SPEC	2.0 $\bar{p} p \rightarrow 3\pi^0, \pi^0 \eta, \pi^0 \eta'$
324 \pm 26 \pm 75		⁷ AMELIN	99	VES	37 $\pi^- A \rightarrow \omega \pi^- \pi^0 A^*$
166 \pm 43		⁸ BALDI	78	SPEC -	10 $\pi^- p \rightarrow p K_S^0 K^-$
510 \pm 200		⁹ CORDEN	78C	OMEG 0	15 $\pi^- p \rightarrow 3\pi n$

- ¹ Statistical error negligible.
- ² From a simultaneous fit to the G_+ and G_0 wave intensities.
- ³ From an amplitude analysis.
- ⁴ Superseded by AGHASYAN 2018B.
- ⁵ Statistical error only.
- ⁶ From the combined analysis of ANISOVICH 99C, ANISOVICH 99E, and ANISOVICH 01F.
- ⁷ May be a different state.
- ⁸ From a fit to the Y_8^0 moment. Limited by phase space.
- ⁹ $J^P = 4^+$ is favored, though $J^P = 2^+$ cannot be excluded.

$a_4(1970)$ 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 $\eta\pi$	seen
Γ_8 $\eta'(958)\pi$	seen

$a_4(1970)$ BRANCHING RATIOS

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

$\Gamma(\pi^+\pi^-\pi^0)/\Gamma_{\text{total}}$					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	EVTS	DOCUMENT ID	TECN	COMMENT	

$1.7^{+0.9}_{-0.8}$ OUR AVERAGE Error includes scale factor of 3.7.

$2.9^{+0.6}_{-0.4}$	46M	¹ AGHASYAN	18B	COMP	190 $\pi^- p \rightarrow \pi^- \pi^+ \pi^- p$
$1.1 \pm 0.2 \pm 0.2$		CHUNG	02	B852	$18.3 \pi^- p \rightarrow 3\pi p$

¹Statistical error negligible.

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

$\Gamma(\eta'(958)\pi)/\Gamma(\eta\pi)$					Γ_8/Γ_7
VALUE	DOCUMENT ID	TECN	COMMENT		
0.23 ± 0.07	ADOLPH	15	COMP	191 $\pi^- p \rightarrow \eta^{(r)} \pi^- p$	

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

a_4 (1970) REFERENCES

AGHASYAN	18B	PR D98 092003	M. Aghasyan <i>et al.</i>	(COMPASS Collab.)
ADOLPH	15	PL B740 303	M. Adolph <i>et al.</i>	(COMPASS Collab.)
ALEKSEEV	10	PRL 104 241803	M.G. Alekseev <i>et al.</i>	(COMPASS Collab.)
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	99C	PL B452 173	A.V. Anisovich <i>et al.</i>	
ANISOVICH	99E	PL B452 187	A.V. Anisovich <i>et al.</i>	
ALDE	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
