$a_2(1700)$

$I^G(J^{PC}) = 1^-(2^{++})$

$a_2(1700)$ MASS

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	COMMENT
1698 ±44		[1] AMSLER	02	CBAR	$0.9\ \overline{p}p \to \pi^0\eta\eta$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
1686 ±22 $^{+19}_{-7}$		[2] KOPF	21	RVUE	$0.9\ p\overline{p} \to \pi^0\pi^0\eta$, $\pi^0\eta\eta$, $\pi^0K^+K^-$ and 191 $\pi^- p \to \pi^-\pi^-\pi^+ p$
1638.9± 2.3$^{+57.4}_{-0.1}$		[3] ALBRECHT	20	RVUE	$0.9\ \overline{p}p \to \pi^0\pi^0\eta$, $\pi^0\eta\eta$, $\pi^0K^+K^-$
1722 ±15 ±67		[4] RODAS	19	JPAC	191 $\pi^- p \to \eta^{(\prime)}\pi^- p$
1681 $^{+22}_{-35}$	46M	[5,6] AGHASYAN	18B	COMP	190 $\pi^- p \to \pi^-\pi^+\pi^- p$
1720 ±10 ±60		[7] JACKURA	18	JPAC	$\pi^- p \to \eta\pi^- p$
1726 ±12 ±25		[6] ABLIKIM	17K	BES3	$\psi(2S) \to \gamma\eta\pi^+\pi^-$
1675 ±25		ANISOVICH	09	RVUE	$0.0\ \overline{p}p$, πN
1722 ± 9 ±15	18k	[8] SCHEGELSKY	06	RVUE	$\gamma\gamma \to \pi^+\pi^-\pi^0$
1702 ± 7	80k	[9] UMAN	06	E835	$5.2\ \overline{p}p \to \eta\eta\pi^0$
1721 ±13 ±44	145k	LU	05	B852	18 $\pi^- p \to \omega\pi^-\pi^0 p$
1737 ± 5 ± 7		ABE	04	BELL	$10.6\ e^+e^- \to e^+e^-K^+K^-$
1767 ±14	221	[10] ACCIARRI	01H	L3	$\gamma\gamma \to K^0_S K^0_S$, E^{ee}_{cm}= 91, 183–209 GeV
1660 ±40		[6] ABELE	99B	CBAR	$1.94\ \overline{p}p \to \pi^0\eta\eta$
∼ 1775		[11] GRYGOREV	99	SPEC	40 $\pi^- p \to K^0_S K^0_S n$
1752 ±21 ± 4		ACCIARRI	97T	L3	$\gamma\gamma \to \pi^+\pi^-\pi^0$

[1] T-matrix pole.
[2] From T-matrix pole based on combined fit of Crystal Barrel and $\pi\pi$ scattering data (ALBRECHT 20), and COMPASS data (ADOLPH 15), using a coupled-channel model of $\eta\pi$, $\eta'\pi$ and $K\overline{K}$ systems.
[3] T-matrix pole, 2 poles, 2 channels ($\pi\eta$, $K\overline{K}$).
[4] The coupled-channel analysis of both the $\eta\pi$ and $\eta'\pi$ systems using ADOLPH 15 data. The mass is extracted from the T-matrix pole.
[5] Statistical error negligible.
[6] Breit-Wigner mass.
[7] Superseded by RODAS 19.
[8] From analysis of L3 data at 183–209 GeV.
[9] Statistical error only.
[10] Spin 2 dominant, isospin not determined, could also be I=1.
[11] Possibly two $J^P = 2^+$ resonances with isospins 0 and 1.

$a_2(1700)$ WIDTH

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	COMMENT
265 ± 55		[1] AMSLER	02	CBAR	$0.9\ \overline{p}p \to \pi^0\eta\eta$

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

$421 \pm 75 \ {}^{+64}_{-57}$		[2] KOPF	21	RVUE	0.9 $p\overline{p} \to \pi^0\pi^0\eta$, $\pi^0\eta\eta$, $\pi^0 K^+ K^-$ and 191 $\pi^- p \to \pi^-\pi^-\pi^+ p$
$224.0 \pm 2.5 \ {}^{+\ 1.8}_{-48.3}$		[3] ALBRECHT	20	RVUE	0.9 $\overline{p}p \to \pi^0\pi^0\eta$, $\pi^0\eta\eta$, $\pi^0 K^+ K^-$
$247 \pm 17 \pm 63$		[4] RODAS	19	JPAC	191 $\pi^- p \to \eta^{(\prime)}\pi^- p$
$436 \ {}^{+\ 20}_{-\ 16}$	46M	[5,6] AGHASYAN	18B	COMP	190 $\pi^- p \to \pi^-\pi^+\pi^- p$
$280 \pm 10 \pm 70$		[7] JACKURA	18	JPAC	$\pi^- p \to \eta\pi^- p$
$190 \pm 18 \pm 30$		[6] ABLIKIM	17K	BES3	$\psi(2S) \to \gamma\eta\pi^+\pi^-$
$270 \ {}^{+\ 50}_{-\ 20}$		ANISOVICH	09	RVUE	0.0 $\overline{p}p$, πN
$336 \pm 20 \pm 20$	18k	[8] SCHEGELSKY	06	RVUE	$\gamma\gamma \to \pi^+\pi^-\pi^0$
417 ± 19	80k	[9] UMAN	06	E835	5.2 $\overline{p}p \to \eta\eta\pi^0$
$279 \pm 49 \pm 66$	145k	LU	05	B852	18 $\pi^- p \to \omega\pi^-\pi^0 p$
$151 \pm 22 \pm 24$		ABE	04	BELL	10.6 $e^+e^- \to e^+e^- K^+K^-$
187 ± 60	221	[10] ACCIARRI	01H	L3	$\gamma\gamma \to K^0_S K^0_S$, E^{ee}_{cm}= 91, 183–209 GeV
280 ± 70		[6] ABELE	99B	CBAR	1.94 $\overline{p}p \to \pi^0\eta\eta$
$150 \pm 110 \pm 34$		ACCIARRI	97T	L3	$\gamma\gamma \to \pi^+\pi^-\pi^0$

[1] T-matrix pole.

[2] From T-matrix pole based on combined fit of Crystal Barrel and $\pi\pi$ scattering data (ALBRECHT 20), and COMPASS data (ADOLPH 15), using a coupled-channel model of $\eta\pi$, $\eta'\pi$ and $K\overline{K}$ systems.

[3] T-matrix pole, 2 poles, 2 channels ($\pi\eta$, $K\overline{K}$).

[4] The coupled-channel analysis of both the $\eta\pi$ and $\eta'\pi$ systems using ADOLPH 15 data. The width is extracted from the T-matrix pole.

[5] Statistical error negligible.

[6] Breit-Wigner width.

[7] Superseded by RODAS 19.

[8] From analysis of L3 data at 183–209 GeV.

[9] Statistical error only.

[10] Spin 2 dominant, isospin not determined, could also be I=1.

$a_2(1700)$ DECAY MODES

	Mode	Fraction (Γ_i/Γ)
Γ_1	$\eta\pi$	(3.6 ± 1.1) %
Γ_2	$\eta'\pi$	
Γ_3	$\gamma\gamma$	$(1.13\pm0.30) \times 10^{-6}$
Γ_4	$\rho\pi$	seen
Γ_5	$f_2(1270)\pi$	seen
Γ_6	$K\overline{K}$	(1.9 ± 1.2) %
Γ_7	$\omega\pi^-\pi^0$	seen
Γ_8	$\omega\rho$	seen

$a_2(1700)$ PARTIAL WIDTHS

$\Gamma(\eta\pi)$ Γ_1

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
9.5±2.0	870	[1] SCHEGELSKY 06A	RVUE	$\gamma\gamma \to K^0_S K^0_S$

[1] From analysis of L3 data at 91 and 183–209 GeV, using $a_2(1700)$ mass of 1730 MeV and width of 340 MeV, and SU(3) relations.

$\Gamma(\gamma\gamma)$ Γ_3

VALUE (keV)	EVTS	DOCUMENT ID	TECN	COMMENT
0.30±0.05	870	[1] SCHEGELSKY 06A	RVUE	$\gamma\gamma \to K^0_S K^0_S$

[1] From analysis of L3 data at 91 and 183–209 GeV, using $a_2(1700)$ mass of 1730 MeV and width of 340 MeV, and SU(3) relations.

$\Gamma(K\overline{K})$ Γ_6

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
5.0±3.0	870	[1] SCHEGELSKY 06A	RVUE	$\gamma\gamma \to K^0_S K^0_S$

[1] From analysis of L3 data at 91 and 183–209 GeV, using $a_2(1700)$ mass of 1730 MeV and width of 340 MeV, and SU(3) relations.

$a_2(1700)$ $\Gamma(i)\Gamma(\gamma\gamma)/\Gamma(\text{total})$

$\left[\Gamma(\rho\pi)+\Gamma(f_2(1270)\pi)\right] \times \Gamma(\gamma\gamma)/\Gamma_{\text{total}}$ $(\Gamma_4+\Gamma_5)\Gamma_3/\Gamma$

VALUE (keV)	EVTS	DOCUMENT ID	TECN	COMMENT
0.29±0.04±0.02		ACCIARRI 97T	L3	$\gamma\gamma \to \pi^+\pi^-\pi^0$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$0.37^{+0.12}_{-0.08}\pm0.10$	18k	[1] SCHEGELSKY 06	RVUE	$\gamma\gamma \to \pi^+\pi^-\pi^0$

[1] From analysis of L3 data at 183–209 GeV.

$\Gamma(K\overline{K}) \times \Gamma(\gamma\gamma)/\Gamma_{\text{total}}$ $\Gamma_6\Gamma_3/\Gamma$

VALUE (eV)	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •			
20.6± 4.2± 4.6	[1] ABE 04	BELL	10.6 $e^+e^- \to e^+e^- K^+K^-$
49 ±11 ±13	[2] ACCIARRI 01H	L3	$\gamma\gamma \to K^0_S K^0_S$, E^{ee}_{cm}= 91, 183–209 GeV

[1] Assuming spin 2.
[2] Spin 2 dominant, isospin not determined, could also be I=1.

$a_2(1700)$ BRANCHING RATIOS

$\Gamma(\rho\pi)/\Gamma(f_2(1270)\pi)$ Γ_4/Γ_5

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
3.4±0.4±0.1	18k	[1] SCHEGELSKY 06	RVUE	$\gamma\gamma \to \pi^+\pi^-\pi^0$

[1] From analysis of L3 data at 183–209 GeV.

$\Gamma(K\overline{K})/\Gamma(\eta\pi)$ Γ_6/Γ_1

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$0.029\pm0.04\ ^{+0.011}_{-0.012}$	[1] KOPF	21	RVUE	0.9 $p\overline{p}\to\pi^0\pi^0\eta$, $\pi^0\eta\eta$, $\pi^0K^+K^-$ and 191 $\pi^-p\to\pi^-\pi^-\pi^+p$
$4.134\pm0.106\ ^{+4.909}_{-2.988}$	[2] ALBRECHT	20	RVUE	0.9 $\overline{p}p\to\pi^0\pi^0\eta$, $\pi^0\eta\eta$, $\pi^0K^+K^-$

[1] From T-matrix pole based on combined fit of Crystal Barrel and $\pi\pi$ scattering data (ALBRECHT 20), and COMPASS data (ADOLPH 15), using a coupled-channel model of $\eta\pi$, $\eta'\pi$ and $K\overline{K}$ systems.

[2] Residues from T-matrix pole, 2 poles, 2 channels ($\pi\eta$, $K\overline{K}$).

$\Gamma(\eta'\pi)/\Gamma(\eta\pi)$ Γ_2/Γ_1

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$0.035\pm0.044\ ^{+0.069}_{-0.012}$	[1] KOPF	21	RVUE	0.9 $p\overline{p}\to\pi^0\pi^0\eta$, $\pi^0\eta\eta$, $\pi^0K^+K^-$ and 191 $\pi^-p\to\pi^-\pi^-\pi^+p$

[1] From T-matrix pole based on combined fit of Crystal Barrel and $\pi\pi$ scattering data (ALBRECHT 20), and COMPASS data (ADOLPH 15), using a coupled-channel model of $\eta\pi$, $\eta'\pi$ and $K\overline{K}$ systems.

$a_2(1700)$ REFERENCES

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ALBRECHT	20	EPJ C80 453	M. Albrecht *et al.*	(Crystal Barrel Collab.)
RODAS	19	PRL 122 042002	A. Rodas *et al.*	(JPAC Collab.)
AGHASYAN	18B	PR D98 092003	M. Aghasyan *et al.*	(COMPASS Collab.)
JACKURA	18	PL B779 464	A. Jackura *et al.*	(JPAC and COMPASS Collab.)
ABLIKIM	17K	PR D95 032002	M. Ablikim *et al.*	(BESIII Collab.)
ADOLPH	15	PL B740 303	M. Adolph *et al.*	(COMPASS Collab.)
ANISOVICH	09	IJMP A24 2481	V.V. Anisovich, A.V. Sarantsev	
SCHEGELSKY	06	EPJ A27 199	V.A. Schegelsky *et al.*	
SCHEGELSKY	06A	EPJ A27 207	V.A. Schegelsky *et al.*	
UMAN	06	PR D73 052009	I. Uman *et al.*	(FNAL E835)
LU	05	PRL 94 032002	M. Lu *et al.*	(BNL E852 Collab.)
ABE	04	EPJ C32 323	K. Abe *et al.*	(BELLE Collab.)
AMSLER	02	EPJ C23 29	C. Amsler *et al.*	
ACCIARRI	01H	PL B501 173	M. Acciarri *et al.*	(L3 Collab.)
ABELE	99B	EPJ C8 67	A. Abele *et al.*	(Crystal Barrel Collab.)
GRYGOREV	99	PAN 62 470	V.K. Grygorev *et al.*	
		Translated from YAF 62 513.		
ACCIARRI	97T	PL B413 147	M. Acciarri *et al.*	(L3 Collab.)