$f_0(1710)$

$I^G(J^{PC}) = 0^+(0^{++})$

See the review on "Spectroscopy of Light Meson Resonances."

$f_0(1710)$ MASS

OUR EVALUATION below is based on T-matrix poles from BARBERIS 00E and BARBERIS 99D.

VALUE (MeV)	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
1704±12 OUR EVALUATION					
$1733^{+\ 8}_{-\ 7}$ OUR AVERAGE Error includes scale factor of 1.5. See the ideogram below.					
$1757\pm24\ \pm\ 9$		[1] LEES	21A	BABR	$\eta_c(1S) \to\ \eta' K^+ K^-$
$1759\pm\ 6\ ^{+14}_{-25}$	5.5k	[2] ABLIKIM	13N	BES3	$e^+ e^- \to\ J/\psi \to\ \gamma\eta\eta$
$1750^{+\ 6}_{-\ 7}\ ^{+29}_{-18}$		[3] UEHARA	13	BELL	$\gamma\gamma \to\ K^0_S K^0_S$
$1701\pm\ 5\ ^{+\ 9}_{-\ 2}$	4k	[4] CHEKANOV	08	ZEUS	$ep \to\ K^0_S K^0_S X$
$1765^{+\ 4}_{-\ 3}\ \pm13$		[1] ABLIKIM	06V	BES2	$e^+ e^- \to\ J/\psi \to\ \gamma\pi^+\pi^-$
1738 ± 30		ABLIKIM	04E	BES2	$J/\psi \to\ \omega K^+ K^-$
$1740\pm\ 4\ ^{+10}_{-25}$		BAI	03G	BES	$J/\psi \to\ \gamma K\overline{K}$
1740^{+30}_{-25}		BAI	00A	BES	$J/\psi \to\ \gamma(\pi^+\pi^-\pi^+\pi^-)$
1710 ± 25		[5] FRENCH	99		300 $pp \to\ p_f(K^+K^-)p_s$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$1769\pm\ 8$		[6] RODAS	22	RVUE	$J/\psi(1S) \to\ \gamma\ (\pi\pi,\ K\overline{K})$
1814 ± 31	7.2k	[7] KHOLODENK..21		VES	29 $\pi^- p \to\ n\omega\phi$
1700 ± 18		[8,9] SARANTSEV	21	RVUE	$J/\psi(1S) \to\ \gamma\ (\pi\pi,\ K\overline{K},\ \eta\eta,\ \omega\phi)$
$1803\pm\ 3.5\ ^{+45.5}_{-10.4}$		[10] ALBRECHT	20	RVUE	0.9 $\overline{p}p \to\ \pi^0\pi^0\eta,\ \pi^0\eta\eta,\ \pi^0 K^+ K^-$
$1744\pm\ 7\ \pm\ 5$	381	[11,12] DOBBS	15		$J/\psi \to\ \gamma\pi^+\pi^-$
$1705\pm11\ \pm\ 5$	237	[11,12] DOBBS	15		$\psi(2S) \to\ \gamma\pi^+\pi^-$
$1706\pm\ 4\ \pm\ 5$	1.0k	[11,12] DOBBS	15		$J/\psi \to\ \gamma K^+ K^-$
$1690\pm\ 8\ \pm\ 3$	349	[11,12] DOBBS	15		$\psi(2S) \to\ \gamma K^+ K^-$
$1795\pm\ 7\ ^{+23}_{-20}$		ABLIKIM	13J	BES3	$J/\psi \to\ \gamma\omega\phi$
$1812^{+19}_{-26}\ \pm18$		[13] ABLIKIM	06J	BES2	$J/\psi \to\ \gamma\omega\phi$
1750 ± 13		AMSLER	06	CBAR	1.64 $\overline{p}p \to\ K^+K^-\pi^0$
$1747\pm\ 5$	80k	[1,14] UMAN	06	E835	5.2 $\overline{p}p \to\ \eta\eta\pi^0$
1776 ± 15		VLADIMIRSK...06		SPEC	40 $\pi^- p \to\ K^0_S K^0_S n$
1790^{+40}_{-30}		[15] ABLIKIM	05	BES2	$J/\psi \to\ \phi\pi^+\pi^-$
$1760\pm15\ ^{+15}_{-10}$		[15] ABLIKIM	05Q	BES2	$\psi(2S) \to\ \gamma\pi^+\pi^- K^+ K^-$
1670 ± 20		[1] BINON	05	GAMS	33 $\pi^- p \to\ \eta\eta n$
$1732+15$		[16] ANISOVICH	03	RVUE	

1682±16				TIKHOMIROV	03	SPEC	40.0 π^- C → $K^0_S K^0_S K^0_L$ X
1670±26		3.6k	[17]	NICHITIU	02	OBLX	0 $\overline{p}p$ → $K^+K^-\pi^+\pi^-\pi^0$
1698±18			[8]	BARBERIS	00E		450 pp → $p_f\eta\eta p_s$
1770±12			[18]	ANISOVICH	99B	SPEC	0.6–1.2 $p\overline{p}$ → $\eta\eta\pi^0$
1730±15				BARBERIS	99	OMEG	450 pp → $p_s p_f K^+K^-$
1750±20				BARBERIS	99B	OMEG	450 pp → $p_s p_f \pi^+\pi^-$
1710±12	±11		[19]	BARBERIS	99D	OMEG	450 pp → K^+K^-, $\pi^+\pi^-$
1750±30			[20]	ANISOVICH	98B	RVUE	Compilation
1720±39				BAI	98H	BES	J/ψ → $\gamma\pi^0\pi^0$
1775± 1.5		57	[21]	BARKOV	98		$\pi^- p$ → $K^0_S K^0_S n$
1690±11			[22]	ABREU	96C	DLPH	Z^0 → K^+K^- + X
1696± 5	$^{+9}_{-34}$		[23]	BAI	96C	BES	J/ψ → γK^+K^-
1781± 8	$^{+10}_{-31}$			BAI	96C	BES	J/ψ → γK^+K^-
1768±14				BALOSHIN	95	SPEC	40 π^- C → $K^0_S K^0_S$ X
1750±15			[24]	BUGG	95	MRK3	J/ψ → $\gamma\pi^+\pi^-\pi^+\pi^-$
1620±16			[23]	BUGG	95	MRK3	J/ψ → $\gamma\pi^+\pi^-\pi^+\pi^-$
1748±10			[25]	ARMSTRONG	93C	E760	$\overline{p}p$ → $\pi^0\eta\eta$ → 6γ
∼ 1750				BREAKSTONE	93	SFM	pp → $pp\pi^+\pi^-\pi^+\pi^-$
1744±15			[26]	ALDE	92D	GAM2	38 $\pi^- p$ → $\eta\eta n$
1713±10			[27]	ARMSTRONG	89D	OMEG	300 pp → ppK^+K^-
1706±10			[27]	ARMSTRONG	89D	OMEG	300 pp → $ppK^0_S K^0_S$
1707±10			[25]	AUGUSTIN	88	DM2	J/ψ → γK^+K^-, $K^0_S K^0_S$
1700±15			[23]	BOLONKIN	88	SPEC	40 $\pi^- p$ → $K^0_S K^0_S n$
1720±60				BOLONKIN	88	SPEC	40 $\pi^- p$ → $K^0_S K^0_S n$
1638±10			[28]	FALVARD	88	DM2	J/ψ → ϕK^+K^-, $K^0_S K^0_S$
1690± 4			[29]	FALVARD	88	DM2	J/ψ → ϕK^+K^-, $K^0_S K^0_S$
1698±15			[25]	AUGUSTIN	87	DM2	J/ψ → $\gamma\pi^+\pi^-$
1720±10	±10		[23]	BALTRUSAIT...	87	MRK3	J/ψ → γK^+K^-
1755± 8			[30]	ALDE	86C	GAM2	38 $\pi^- p$ → $n2\eta$
1730^{+2}_{-10}			[31]	LONGACRE	86	RVUE	22 $\pi^- p$ → $n2K^0_S$
1742±15			[25]	WILLIAMS	84	MPSF	200 $\pi^- N$ → $2K^0_S$ X
1670±50				BLOOM	83	CBAL	J/ψ → $\gamma 2\eta$
1650±50				BURKE	82	MRK2	J/ψ → $\gamma 2\rho$
1640±50			[32,33]	EDWARDS	82D	CBAL	J/ψ → $\gamma 2\eta$
1730±10	±20		[34]	ETKIN	82C	MPS	23 $\pi^- p$ → $n2K^0_S$

[1] Breit-Wigner mass.

[2] From partial wave analysis including all possible combinations of 0^{++}, 2^{++}, and 4^{++} resonances.

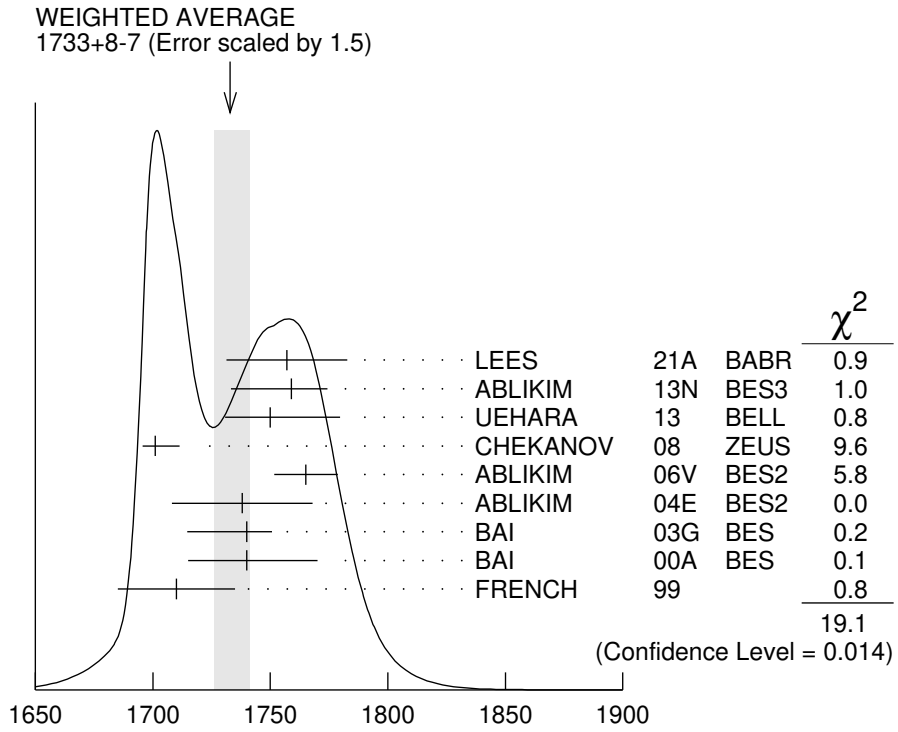
[3] Spin 0 favored over spin 2.

[4] In the SU(3) based model with a specific interference pattern of the $f_2(1270)$, $a_2^0(1320)$, and $f_2'(1525)$ mesons incoherently added to the $f_0(1710)$ and non-resonant background.

[5] $J^P = 0^+$, supersedes by ARMSTRONG 89D.

[6] T-matrix pole from coupled channel K-matrix fit to data on J/ψ → $\gamma\pi^0\pi^0$ (ABLIKIM 15AE) and J/ψ → $\gamma K^0_S K^0_S$ (ABLIKIM 18AA).

[7] From partial wave analysis of $\omega\phi$ invariant mass including 0^{++}, 2^{++}, and 0^{-+} resonances.
[8] T-matrix pole.
[9] Close-by state with mass 1765 $\pm$ 15 MeV and width 180 $\pm$ 20 MeV.
[10] T-matrix pole, 5 poles, 5 channels, including scattering data from HYAMS 75 ($\pi\pi$), LONGACRE 86 ($K\overline{K}$), BINON 83 ($\eta\eta$), and BINON 84C ($\eta\eta'$).
[11] Using CLEO-c data but not authored by the CLEO Collaboration.
[12] From a fit to a Breit-Wigner line shape with fixed $\Gamma = 135$ MeV.
[13] Not seen by LIU 09 in $B^{\pm} \to K^{\pm}\omega\phi$.
[14] Systematic errors not estimated.
[15] This state may be different from $f_0(1710)$, see CLOSE 05.
[16] K-matrix pole, assuming $J^P = 0^+$, from combined analysis of $\pi^- p \to \pi^0\pi^0 n$, $\pi^- p \to K\overline{K} n$, $\pi^+\pi^- \to \pi^+\pi^-$, $\overline{p}p \to \pi^0\pi^0\pi^0$, $\pi^0\eta\eta$, $\pi^0\pi^0\eta$, $\pi^+\pi^-\pi^0$, $K^+K^-\pi^0$, $K^0_S K^0_S\pi^0$, $K^+K^0_S\pi^-$ at rest, $\overline{p}n \to \pi^-\pi^-\pi^+$, $K^0_S K^-\pi^0$, $K^0_S K^0_S\pi^-$ at rest.
[17] Decaying to $f_0(1370)\pi\pi$.
[18] Not seen by AMSLER 02.
[19] Supersedes BARBERIS 99 and BARBERIS 99B.
[20] T-matrix pole, assuming $J^P = 0^+$
[21] No J^{PC} determination.
[22] No J^{PC} determination, width not determined.
[23] $J^P = 2^+$.
[24] From a fit to the 0^+ partial wave.
[25] No J^{PC} determination.
[26] ALDE 92D combines all the GAMS-2000 data.
[27] $J^P = 2^+$, superseded by FRENCH 99.
[28] From an analysis ignoring interference with $f'_2(1525)$.
[29] From an analysis including interference with $f'_2(1525)$.
[30] Superseded by ALDE 92D.
[31] Uses MRK3 data. From a partial-wave analysis of data using a K-matrix formalism with 5 poles, but assuming spin 2. Fit with constrained inelasticity.
[32] $J^P = 2^+$ preferred.
[33] From fit neglecting nearby $f'_2(1525)$. Replaced by BLOOM 83.
[34] Superseded by LONGACRE 86.



$f_0(1710)$ WIDTH

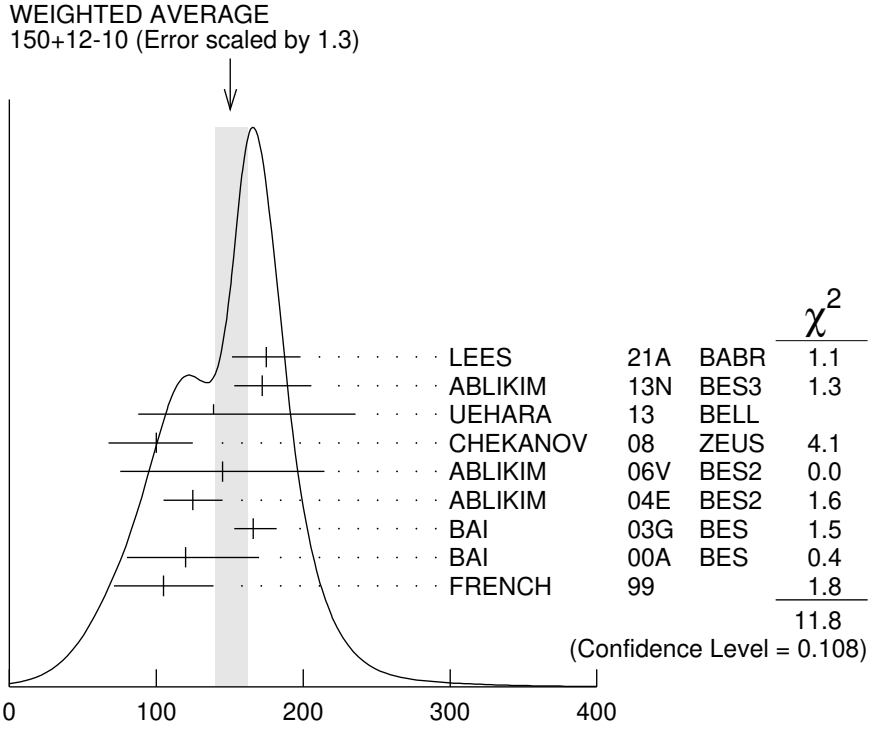
OUR EVALUATION below is based on T-matrix poles from BARBERIS 00E and BARBERIS 99D.

VALUE (MeV)	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
123 ± 18 OUR EVALUATION					
150 $^{+12}_{-10}$ OUR AVERAGE Error includes scale factor of 1.3. See the ideogram below.					
175 ± 23 ± 4		[1] LEES	21A	BABR	$\eta_c(1S) \to \eta' K^+ K^-$
172 ± 10 $^{+32}_{-16}$	5.5k	[2] ABLIKIM	13N	BES3	$e^+e^- \to J/\psi \to \gamma\eta\eta$
139 $^{+11}_{-12}$ $^{+96}_{-50}$		[3] UEHARA	13	BELL	$\gamma\gamma \to K^0_S K^0_S$
100 ± 24 $^{+7}_{-22}$	4k	[4] CHEKANOV	08	ZEUS	$ep \to K^0_S K^0_S X$
145 ± 8 ±69		[1] ABLIKIM	06V	BES2	$e^+e^- \to J/\psi \to \gamma\pi^+\pi^-$
125 ± 20		ABLIKIM	04E	BES2	$J/\psi \to \omega K^+ K^-$
166 $^{+5}_{-8}$ $^{+15}_{-10}$		BAI	03G	BES	$J/\psi \to \gamma K\overline{K}$
120 $^{+50}_{-40}$		BAI	00A	BES	$J/\psi \to \gamma(\pi^+\pi^-\pi^+\pi^-)$
105 ± 34		[5] FRENCH	99		$300\ pp \to p_f(K^+K^-)p_s$

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

156	± 12			[6]	RODAS	22	RVUE	$J/\psi(1S) \to \gamma\,(\pi\pi,\ K\overline{K})$
182	± 19		7.2k	[7]	KHOLODENK..	21	VES	$29\ \pi^- p \to n\omega\phi$
255	± 25			[8,9]	SARANTSEV	21	RVUE	$J/\psi(1S) \to \gamma\,(\pi\pi,\ K\overline{K},\ \eta\eta,\ \omega\phi)$
289.7	± 5.0	$^{+32.6}_{-19.3}$		[10]	ALBRECHT	20	RVUE	$0.9\ \overline{p}p \to \pi^0\pi^0\eta,\ \pi^0\eta\eta,\ \pi^0 K^+K^-$
95	± 10	$^{+78}_{-82}$			ABLIKIM	13J	BES3	$J/\psi \to \gamma\omega\phi$
105	± 20	±28		[11]	ABLIKIM	06J	BES2	$J/\psi \to \gamma\omega\phi$
148	$^{+\ 40}_{-\ 30}$				AMSLER	06	CBAR	$1.64\ \overline{p}p \to K^+K^-\pi^0$
188	± 13		80k	[1,12]	UMAN	06	E835	$5.2\ \overline{p}p \to \eta\eta\pi^0$
250	± 30				VLADIMIRSK..	06	SPEC	$40\ \pi^- p \to K^0_S K^0_S n$
270	$^{+\ 60}_{-\ 30}$			[13]	ABLIKIM	05	BES2	$J/\psi \to \phi\pi^+\pi^-$
125	± 25	$^{+10}_{-15}$		[1]	ABLIKIM	05Q	BES2	$\psi(2S) \to \gamma\pi^+\pi^- K^+K^-$
260	± 50			[1]	BINON	05	GAMS	$33\ \pi^- p \to \eta\eta n$
144	± 30			[14,15]	ANISOVICH	03	RVUE	
320	$^{+\ 50}_{-\ 20}$			[15,16]	ANISOVICH	03	RVUE	
102	± 26				TIKHOMIROV	03	SPEC	$40.0\ \pi^- C \to K^0_S K^0_S K^0_L X$
267	± 44		3651	[17]	NICHITIU	02	OBLX	$0\ \overline{p}p \to K^+K^-\pi^+\pi^-\pi^0$
120	± 26			[9]	BARBERIS	00E		$450\ pp \to p_f\eta\eta p_s$
220	± 40			[18,19]	ANISOVICH	99B	SPEC	$0.6\text{–}1.2\ p\overline{p} \to \eta\eta\pi^0$
100	± 25				BARBERIS	99	OMEG	$450\ pp \to p_s p_f K^+K^-$
160	± 30				BARBERIS	99B	OMEG	$450\ pp \to p_s p_f \pi^+\pi^-$
126	± 16	±18		[9,20]	BARBERIS	99D	OMEG	$450\ pp \to K^+K^-,\ \pi^+\pi^-$
250	±140			[21]	ANISOVICH	98B	RVUE	Compilation
30	± 7		57	[22]	BARKOV	98		$\pi^- p \to K^0_S K^0_S n$
103	± 18	$^{+30}_{-11}$		[23]	BAI	96C	BES	$J/\psi \to \gamma K^+K^-$
85	± 24	$^{+22}_{-19}$			BAI	96C	BES	$J/\psi \to \gamma K^+K^-$
56	± 19				BALOSHIN	95	SPEC	$40\ \pi^- C \to K^0_S K^0_S X$
160	± 40			[24]	BUGG	95	MRK3	$J/\psi \to \gamma\pi^+\pi^-\pi^+\pi^-$
160	$^{+\ 60}_{-\ 20}$			[23]	BUGG	95	MRK3	$J/\psi \to \gamma\pi^+\pi^-\pi^+\pi^-$
264	± 25			[25]	ARMSTRONG	93C	E760	$\overline{p}p \to \pi^0\eta\eta \to 6\gamma$
200	to 300				BREAKSTONE	93	SFM	$pp \to pp\pi^+\pi^-\pi^+\pi^-$
< 80	90% CL			[26]	ALDE	92D	GAM2	$38\ \pi^- p \to \eta\eta N^*$
181	± 30			[27]	ARMSTRONG	89D	OMEG	$300\ pp \to pp K^+K^-$
104	± 30			[27]	ARMSTRONG	89D	OMEG	$300\ pp \to pp K^0_S K^0_S$
166.4	± 33.2			[25]	AUGUSTIN	88	DM2	$J/\psi \to \gamma K^+K^-,\ K^0_S K^0_S$
30	± 20			[23]	BOLONKIN	88	SPEC	$40\ \pi^- p \to K^0_S K^0_S n$
350	±150				BOLONKIN	88	SPEC	$40\ \pi^- p \to K^0_S K^0_S n$
148	± 17			[28]	FALVARD	88	DM2	$J/\psi \to \phi K^+K^-,\ K^0_S K^0_S$

184	± 6	[29] FALVARD	88	DM2	$J/\psi \to \phi K^+ K^-$, $K^0_S K^0_S$
136	± 28	[25] AUGUSTIN	87	DM2	$J/\psi \to \gamma \pi^+ \pi^-$
130	± 20	[23] BALTRUSAIT...	87	MRK3	$J/\psi \to \gamma K^+ K^-$
122	$^{+\ 74}_{-\ 15}$	[30] LONGACRE	86	RVUE	22 $\pi^- p \to n 2K^0_S$
57	± 38	[31] WILLIAMS	84	MPSF	200 $\pi^- N \to 2K^0_S X$
160	± 80	BLOOM	83	CBAL	$J/\psi \to \gamma 2\eta$
200	±100	BURKE	82	MRK2	$J/\psi \to \gamma 2\rho$
220	$^{+100}_{-\ 70}$	[32,33] EDWARDS	82D	CBAL	$J/\psi \to \gamma 2\eta$
200	$^{+156}_{-\ 9}$	[34] ETKIN	82B	MPS	23 $\pi^- p \to n 2K^0_S$



[1] Breit-Wigner width.

[2] From partial wave analysis including all possible combinations of 0^{++}, 2^{++}, and 4^{++} resonances.

[3] Spin 0 favored over spin 2.

[4] In the SU(3) based model with a specific interference pattern of the $f_2(1270)$, $a_2^0(1320)$, and $f_2'(1525)$ mesons incoherently added to the $f_0(1710)$ and non-resonant background.

[5] $J^P = 0^+$, supersedes by ARMSTRONG 89D.

[6] T-matrix pole from coupled channel K-matrix fit to data on $J/\psi \to \gamma \pi^0 \pi^0$ (ABLIKIM 15AE) and $J/\psi \to \gamma K^0_S K^0_S$ (ABLIKIM 18AA).

[7] From partial wave analysis of $\omega\phi$ invariant mass including 0^{++}, 2^{++}, and 0^{-+} resonances.

[8] Close-by state with mass 1765 ± 15 MeV and width 180 ± 20 MeV.

[9] T-matrix pole.

[10] T-matrix pole, 5 poles, 5 channels, including scattering data from HYAMS 75 ($\pi\pi$), LONGACRE 86 ($K\overline{K}$), BINON 83 ($\eta\eta$), and BINON 84C ($\eta\eta'$).

[11] Not seen by LIU 09 in $B^{\pm} \to K^{\pm}\omega\phi$.
[12] Systematic errors not estimated.
[13] This state may be different from $f_0(1710)$, see CLOSE 05.
[14] (Solution I)
[15] K-matrix pole, assuming $J^P = 0^+$, from combined analysis of $\pi^- p \to \pi^0\pi^0 n$, $\pi^- p \to K\overline{K} n$, $\pi^+\pi^- \to \pi^+\pi^-$, $\overline{p}p \to \pi^0\pi^0\pi^0$, $\pi^0\eta\eta$, $\pi^0\pi^0\eta$, $\pi^+\pi^-\pi^0$, $K^+K^-\pi^0$, $K^0_S K^0_S\pi^0$, $K^+K^0_S\pi^-$ at rest, $\overline{p}n \to \pi^-\pi^-\pi^+$, $K^0_S K^-\pi^0$, $K^0_S K^0_S\pi^-$ at rest.
[16] Solution I.
[17] Decaying to $f_0(1370)\pi\pi$.
[18] $J^P = 0^+$.
[19] Not seen by AMSLER 02.
[20] Supersedes BARBERIS 99 and BARBERIS 99B.
[21] T-matrix pole, assuming $J^P = 0^+$
[22] No J^{PC} determination.
[23] $J^P = 2^+$.
[24] From a fit to the 0^+ partial wave.
[25] No J^{PC} determination.
[26] ALDE 92D combines all the GAMS-2000 data.
[27] $J^P = 2^+$, (0^+ excluded).
[28] From an analysis ignoring interference with $f'_2(1525)$.
[29] From an analysis including interference with $f'_2(1525)$.
[30] Uses MRK3 data. From a partial-wave analysis of data using a K-matrix formalism with 5 poles, but assuming spin 2. Fit with constrained inelasticity.
[31] No J^{PC} determination.
[32] $J^P = 2^+$ preferred.
[33] From fit neglecting nearby $f'_2(1525)$. Replaced by BLOOM 83.
[34] From an amplitude analysis of the $K^0_S K^0_S$ system, superseded by LONGACRE 86.

$f_0(1710)$ width (MeV)

$f_0(1710)$ DECAY MODES

	Mode	Fraction (Γ_i/Γ)
Γ_1	$K\overline{K}$	seen
Γ_2	$\eta\eta$	seen
Γ_3	$\pi\pi$	seen
Γ_4	$\gamma\gamma$	seen
Γ_5	$\omega\omega$	seen

$f_0(1710)$ Γ(i)$\Gamma(\gamma\gamma)/\Gamma$(total)

$\Gamma(K\overline{K}) \times \Gamma(\gamma\gamma)/\Gamma_{\text{total}}$ $\quad\quad$ $\Gamma_1\Gamma_4/\Gamma$

VALUE (eV)	*CL%*	*DOCUMENT ID*		*TECN*	*COMMENT*
$\mathbf{12^{+3+227}_{-2-8}}$		UEHARA	13	BELL	$\gamma\gamma \to K^0_S K^0_S$

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

<480	95	ALBRECHT	90G	ARG	$\gamma\gamma \to K^+K^-$
<110	95	[1] BEHREND	89C	CELL	$\gamma\gamma \to K^0_S K^0_S$
<280	95	[1] ALTHOFF	85B	TASS	$\gamma\gamma \to K\overline{K}\pi$

[1] Assuming helicity 2.

$\Gamma(\pi\pi) \times \Gamma(\gamma\gamma)/\Gamma_{total}$ $\Gamma_3\Gamma_4/\Gamma$

VALUE (keV)	CL%	DOCUMENT ID		TECN	COMMENT
<0.82	95	[1] BARATE	00E	ALEP	$\gamma\gamma \to \pi^+\pi^-$

[1] Assuming spin 0.

$f_0(1710)$ BRANCHING RATIOS

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

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
seen	1004	[1] DOBBS	15		$J/\psi \to \gamma K^+K^-$
seen	349	[1] DOBBS	15		$\psi(2S) \to \gamma K^+K^-$
0.36 ± 0.12		ALBALADEJO	08	RVUE	
$0.38^{+0.09}_{-0.19}$		[2] LONGACRE	86	MPS	$22\ \pi^- p \to n 2K^0_S$

[1] Using CLEO-c data but not authored by the CLEO Collaboration.
[2] From a partial-wave analysis of data using a K-matrix formalism with 5 poles, but assuming spin 2. Fit with constrained inelasticity.

$\Gamma(\eta\eta)/\Gamma_{total}$ Γ_2/Γ

VALUE	DOCUMENT ID		TECN
• • • We do not use the following data for averages, fits, limits, etc. • • •			
0.22 ± 0.12	ALBALADEJO	08	RVUE
$0.18^{+0.03}_{-0.13}$	[1] LONGACRE	86	RVUE

[1] From a partial-wave analysis of data using a K-matrix formalism with 5 poles, but assuming spin 2. Fit with constrained inelasticity.

$\Gamma(\pi\pi)/\Gamma_{total}$ Γ_3/Γ

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
seen	381	[1] DOBBS	15		$J/\psi \to \gamma\pi^+\pi^-$
seen	237	[1] DOBBS	15		$\psi(2S) \to \gamma\pi^+\pi^-$
not seen		AMSLER	02	CBAR	$0.9\ \overline{p}p \to \pi^0\eta\eta,\ \pi^0\pi^0\pi^0$
$0.039^{+0.002}_{-0.024}$		[2] LONGACRE	86	RVUE	

[1] Using CLEO-c data but not authored by the CLEO Collaboration.
[2] From a partial-wave analysis of data using a K-matrix formalism with 5 poles, but assuming spin 2. Fit with constrained inelasticity.

$\Gamma(\pi\pi)/\Gamma(K\overline{K})$ Γ_3/Γ_1

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
0.23±0.05 OUR AVERAGE		Error includes scale factor of 1.2.			
$0.64 \pm 0.27 \pm 0.18$		LEES	18A	BABR	$\Upsilon(1S) \to \gamma\pi^+\pi^-,\ \gamma K^+K^-$
$0.41^{+0.11}_{-0.17}$		ABLIKIM	06V	BES2	$e^+e^- \to J/\psi \to \gamma\pi^+\pi^-$
$0.2 \pm 0.024 \pm 0.036$		BARBERIS	99D	OMEG	$450\ pp \to K^+K^-,\ \pi^+\pi^-$
0.39 ± 0.14		ARMSTRONG	91	OMEG	$300\ pp \to pp\pi\pi,\ pp K\overline{K}$

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

0.32 ± 0.14		ALBALADEJO	08	RVUE	
< 0.11	95	[1] ABLIKIM	04E	BES2	$J/\psi \to \omega K^+ K^-$
$5.8\ ^{+9.1}_{-5.5}$		[2] ANISOVICH	02D	SPEC	Combined fit

[1] Using data from ABLIKIM 04A.

[2] From a combined K-matrix analysis of Crystal Barrel (0. $p\overline{p} \to \pi^0\pi^0\pi^0$, $\pi^0\eta\eta$, $\pi^0\pi^0\eta$), GAMS ($\pi p \to \pi^0\pi^0 n$, $\eta\eta n$, $\eta\eta' n$), and BNL ($\pi p \to K\overline{K} n$) data.

$\Gamma(\eta\eta)/\Gamma(K\overline{K})$ Γ_2/Γ_1

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
0.48±0.15		BARBERIS	00E		450 $pp \to p_f \eta\eta p_s$

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

$0.46\ ^{+0.70}_{-0.38}$		[1] ANISOVICH	02D	SPEC	Combined fit
<0.02	90	[2] PROKOSHKIN	91	GA24	300 $\pi^- p \to \pi^- p\eta\eta$

[1] From a combined K-matrix analysis of Crystal Barrel (0. $p\overline{p} \to \pi^0\pi^0\pi^0$, $\pi^0\eta\eta$, $\pi^0\pi^0\eta$), GAMS ($\pi p \to \pi^0\pi^0 n$, $\eta\eta n$, $\eta\eta' n$), and BNL ($\pi p \to K\overline{K} n$) data.

[2] Combining results of GAM4 with those of ARMSTRONG 89D.

$\Gamma(\omega\omega)/\Gamma_{\text{total}}$ Γ_5/Γ

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
seen	180	ABLIKIM	06H	BES	$J/\psi \to \gamma\omega\omega$

$f_0(1710)$ REFERENCES

RODAS	22	EPJ C82 80	A. Rodas *et al.*	(JPAC Collab.)
KHOLODENK...	21	PAN 83 1602	M.S. Kholodenko	(VES Collab.)
LEES	21A	PR D104 072002	J.P. Lees *et al.*	(BABAR Collab.)
SARANTSEV	21	PL B816 136227	A.V. Sarantsev *et al.*	(BONN, PNPI)
ALBRECHT	20	EPJ C80 453	M. Albrecht *et al.*	(Crystal Barrel Collab.)
ABLIKIM	18AA	PR D98 072003	M. Ablikim *et al.*	(BESIII Collab.)
LEES	18A	PR D97 112006	J.P. Lees *et al.*	(BABAR Collab.)
ABLIKIM	15AE	PR D92 052003	M. Ablikim *et al.*	(BESIII Collab.)
DOBBS	15	PR D91 052006	S. Dobbs *et al.*	(NWES)
ABLIKIM	13J	PR D87 032008	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	13N	PR D87 092009	M. Ablikim *et al.*	(BESIII Collab.)
UEHARA	13	PTEP 2013 123C01	S. Uehara *et al.*	(BELLE Collab.)
LIU	09	PR D79 071102	C. Liu *et al.*	(BELLE Collab.)
ALBALADEJO	08	PRL 101 252002	M. Albaladejo, J.A. Oller	
CHEKANOV	08	PRL 101 112003	S. Chekanov *et al.*	(ZEUS Collab.)
ABLIKIM	06H	PR D73 112007	M. Ablikim *et al.*	(BES Collab.)
ABLIKIM	06J	PRL 96 162002	M. Ablikim *et al.*	(BES Collab.)
ABLIKIM	06V	PL B642 441	M. Ablikim *et al.*	(BES Collab.)
AMSLER	06	PL B639 165	C. Amsler *et al.*	(Crystal Barrel Collab.)
UMAN	06	PR D73 052009	I. Uman *et al.*	(FNAL E835)
VLADIMIRSK...	06	PAN 69 493	V.V. Vladimirsky *et al.*	(ITEP, Moscow)
		Translated from YAF 69 515.		
ABLIKIM	05	PL B607 243	M. Ablikim *et al.*	(BES Collab.)
ABLIKIM	05Q	PR D72 092002	M. Ablikim *et al.*	(BES Collab.)
BINON	05	PAN 68 960	F. Binon *et al.*	
		Translated from YAF 68 998.		
CLOSE	05	PR D71 094022	F.E. Close, Q. Zhao	
ABLIKIM	04A	PL B598 149	M. Ablikim *et al.*	(BES Collab.)
ABLIKIM	04E	PL B603 138	M. Ablikim *et al.*	(BES Collab.)
ANISOVICH	03	EPJ A16 229	V.V. Anisovich *et al.*	
BAI	03G	PR D68 052003	J.Z. Bai *et al.*	(BES Collab.)
TIKHOMIROV	03	PAN 66 828	G.D. Tikhomirov *et al.*	
		Translated from YAF 66 860.		

AMSLER	02	EPJ C23 29	C. Amsler *et al.*	
ANISOVICH	02D	PAN 65 1545	V.V. Anisovich *et al.*	
		Translated from YAF 65 1583.		
NICHITIU	02	PL B545 261	F. Nichitiu *et al.*	(OBELIX Collab.)
BAI	00A	PL B472 207	J.Z. Bai *et al.*	(BES Collab.)
BARATE	00E	PL B472 189	R. Barate *et al.*	(ALEPH Collab.)
BARBERIS	00E	PL B479 59	D. Barberis *et al.*	(WA 102 Collab.)
ANISOVICH	99B	PL B449 154	A.V. Anisovich *et al.*	
BARBERIS	99	PL B453 305	D. Barberis *et al.*	(Omega Expt.)
BARBERIS	99B	PL B453 316	D. Barberis *et al.*	(Omega Expt.)
BARBERIS	99D	PL B462 462	D. Barberis *et al.*	(Omega Expt.)
FRENCH	99	PL B460 213	B. French *et al.*	(WA76 Collab.)
ANISOVICH	98B	SPU 41 419	V.V. Anisovich *et al.*	
		Translated from UFN 168 481.		
BAI	98H	PRL 81 1179	J.Z. Bai *et al.*	(BES Collab.)
BARKOV	98	JETPL 68 764	B.P. Barkov *et al.*	
ABREU	96C	PL B379 309	P. Abreu *et al.*	(DELPHI Collab.)
BAI	96C	PRL 77 3959	J.Z. Bai *et al.*	(BES Collab.)
BALOSHIN	95	PAN 58 46	O.N. Baloshin *et al.*	(ITEP)
		Translated from YAF 58 50.		
BUGG	95	PL B353 378	D.V. Bugg *et al.*	(LOQM, PNPI, WASH)
ARMSTRONG	93C	PL B307 394	T.A. Armstrong *et al.*	(FNAL, FERR, GENO+)
BREAKSTONE	93	ZPHY C58 251	A.M. Breakstone *et al.*	(IOWA, CERN, DORT+)
ALDE	92D	PL B284 457	D.M. Alde *et al.*	(GAM2 Collab.)
Also		SJNP 54 451	D.M. Alde *et al.*	(GAM2 Collab.)
		Translated from YAF 54 745.		
ARMSTRONG	91	ZPHY C51 351	T.A. Armstrong *et al.*	(ATHU, BARI, BIRM+)
PROKOSHKIN	91	SPD 36 155	Y.D. Prokoshkin	(GAM2 and GAM4 Collab.)
		Translated from DANS 316 900.		
ALBRECHT	90G	ZPHY C48 183	H. Albrecht *et al.*	(ARGUS Collab.)
ARMSTRONG	89D	PL B227 186	T.A. Armstrong, M. Benayoun	(ATHU, BARI, BIRM+)
BEHREND	89C	ZPHY C43 91	H.J. Behrend *et al.*	(CELLO Collab.)
AUGUSTIN	88	PRL 60 2238	J.E. Augustin *et al.*	(DM2 Collab.)
BOLONKIN	88	NP B309 426	B.V. Bolonkin *et al.*	(ITEP, SERP)
FALVARD	88	PR D38 2706	A. Falvard *et al.*	(CLER, FRAS, LALO+)
AUGUSTIN	87	ZPHY C36 369	J.E. Augustin *et al.*	(LALO, CLER, FRAS+)
BALTRUSAIT...	87	PR D35 2077	R.M. Baltrusaitis *et al.*	(Mark III Collab.)
ALDE	86C	PL B182 105	D.M. Alde *et al.*	(SERP, BELG, LANL, LAPP)
LONGACRE	86	PL B177 223	R.S. Longacre *et al.*	(BNL, BRAN, CUNY+)
ALTHOFF	85B	ZPHY C29 189	M. Althoff *et al.*	(TASSO Collab.)
BINON	84C	NC 80A 363	F.G. Binon *et al.*	(BELG, LAPP, SERP+)
WILLIAMS	84	PR D30 877	E.G.H. Williams *et al.*	(VAND, NDAM, TUFTS+)
BINON	83	NC 78A 313	F.G. Binon *et al.*	(BELG, LAPP, SERP+)
BLOOM	83	ARNS 33 143	E.D. Bloom, C. Peck	(SLAC, CIT)
BURKE	82	PRL 49 632	D.L. Burke *et al.*	(LBL, SLAC)
EDWARDS	82D	PRL 48 458	C. Edwards *et al.*	(CIT, HARV, PRIN+)
ETKIN	82B	PR D25 1786	A. Etkin *et al.*	(BNL, CUNY, TUFTS, VAND)
ETKIN	82C	PR D25 2446	A. Etkin *et al.*	(BNL, CUNY, TUFTS, VAND)
HYAMS	75	NP B100 205	B.D. Hyams *et al.*	(CERN, MPIM)