$f_0(1710)$

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

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.			
$1757 \pm 24 \pm 9$		[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	$e p \to K^0_S K^0_S X$
$1765^{+4}_{-3} \pm 13$		[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		$300\ p p \to p_f (K^+ K^-) p_s$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
1769 ± 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		$J/\psi \to \gamma\pi^+\pi^-$
$1705 \pm 11 \pm 5$	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	$J/\psi \to \gamma\omega\phi$
$1812^{+19}_{-26} \pm 18$		[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 ± 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	$J/\psi \to \phi\pi^+\pi^-$
$1760 \pm 15\ ^{+15}_{-10}$		[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	$40.0\ \pi^- C \to K^0_S K^0_S K^0_L X$
1670±26		3.6k	[17] NICHITIU	02	OBLX	$0\ \overline{p}p \to K^+K^-\pi^+\pi^-\pi^0$
1698±18			[8] BARBERIS	00E		$450\ pp \to p_f \eta\eta p_s$
1770±12			[18] ANISOVICH	99B	SPEC	$0.6–1.2\ p\overline{p} \to \eta\eta\pi^0$
1730±15			BARBERIS	99	OMEG	$450\ pp \to p_s p_f K^+K^-$
1750±20			BARBERIS	99B	OMEG	$450\ pp \to p_s p_f \pi^+\pi^-$
1710±12	±11		[19] BARBERIS	99D	OMEG	$450\ pp \to K^+K^-, \pi^+\pi^-$
1750±30			[20] ANISOVICH	98B	RVUE	Compilation
1720±39			BAI	98H	BES	$J/\psi \to \gamma\pi^0\pi^0$
1775± 1.5		57	[21] BARKOV	98		$\pi^- p \to K^0_S K^0_S n$
1690±11			[22] ABREU	96C	DLPH	$Z^0 \to K^+K^- + X$
1696± 5	$^{+\ 9}_{-34}$		[23] BAI	96C	BES	$J/\psi \to \gamma K^+K^-$
1781± 8	$^{+10}_{-31}$		BAI	96C	BES	$J/\psi \to \gamma K^+K^-$
1768±14			BALOSHIN	95	SPEC	$40\ \pi^- C \to K^0_S K^0_S X$
1750±15			[24] BUGG	95	MRK3	$J/\psi \to \gamma\pi^+\pi^-\pi^+\pi^-$
1620±16			[23] BUGG	95	MRK3	$J/\psi \to \gamma\pi^+\pi^-\pi^+\pi^-$
1748±10			[25] ARMSTRONG	93C	E760	$\overline{p}p \to \pi^0\eta\eta \to 6\gamma$
∼ 1750			BREAKSTONE	93	SFM	$pp \to pp\pi^+\pi^-\pi^+\pi^-$
1744±15			[26] ALDE	92D	GAM2	$38\ \pi^- p \to \eta\eta n$
1713±10			[27] ARMSTRONG	89D	OMEG	$300\ pp \to ppK^+K^-$
1706±10			[27] ARMSTRONG	89D	OMEG	$300\ pp \to ppK^0_S K^0_S$
1707±10			[25] AUGUSTIN	88	DM2	$J/\psi \to \gamma K^+K^-, K^0_S K^0_S$
1700±15			[23] BOLONKIN	88	SPEC	$40\ \pi^- p \to K^0_S K^0_S n$
1720±60			BOLONKIN	88	SPEC	$40\ \pi^- p \to K^0_S K^0_S n$
1638±10			[28] FALVARD	88	DM2	$J/\psi \to \phi K^+K^-, K^0_S K^0_S$
1690± 4			[29] FALVARD	88	DM2	$J/\psi \to \phi K^+K^-, K^0_S K^0_S$
1698±15			[25] AUGUSTIN	87	DM2	$J/\psi \to \gamma\pi^+\pi^-$
1720±10	±10		[23] BALTRUSAIT...	87	MRK3	$J/\psi \to \gamma K^+K^-$
1755± 8			[30] ALDE	86C	GAM2	$38\ \pi^- p \to n2\eta$
$1730^{+\ 2}_{-10}$			[31] LONGACRE	86	RVUE	$22\ \pi^- p \to n2K^0_S$
1742±15			[25] WILLIAMS	84	MPSF	$200\ \pi^- N \to 2K^0_S X$
1670±50			BLOOM	83	CBAL	$J/\psi \to \gamma 2\eta$
1650±50			BURKE	82	MRK2	$J/\psi \to \gamma 2\rho$
1640±50			[32,33] EDWARDS	82D	CBAL	$J/\psi \to \gamma 2\eta$
1730±10	±20		[34] ETKIN	82C	MPS	$23\ \pi^- p \to n2K^0_S$

[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 $f_2(1270)$, $a^0_2(1320)$, 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] T-matrix pole.

[9] Close-by state with mass 1765 ± 15 MeV and width 180 ± 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 $B^{\pm} \rightarrow K^{\pm}\omega\phi$.

[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 $\pi^- p \rightarrow \pi^0\pi^0 n$, $\pi^- p \rightarrow K\overline{K} n$, $\pi^+\pi^- \rightarrow \pi^+\pi^-$, $\overline{p}p \rightarrow \pi^0\pi^0\pi^0$, $\pi^0\eta\eta$, $\pi^0\pi^0\eta$, $\pi^+\pi^-\pi^0$, $K^+K^-\pi^0$, $K^0_S K^0_S \pi^0$, $K^+ K^0_S \pi^-$ at rest, $\overline{p}n \rightarrow \pi^-\pi^-\pi^+$, $K^0_S K^-\pi^0$, $K^0_S K^0_S \pi^-$ 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 $f'_2(1525)$.

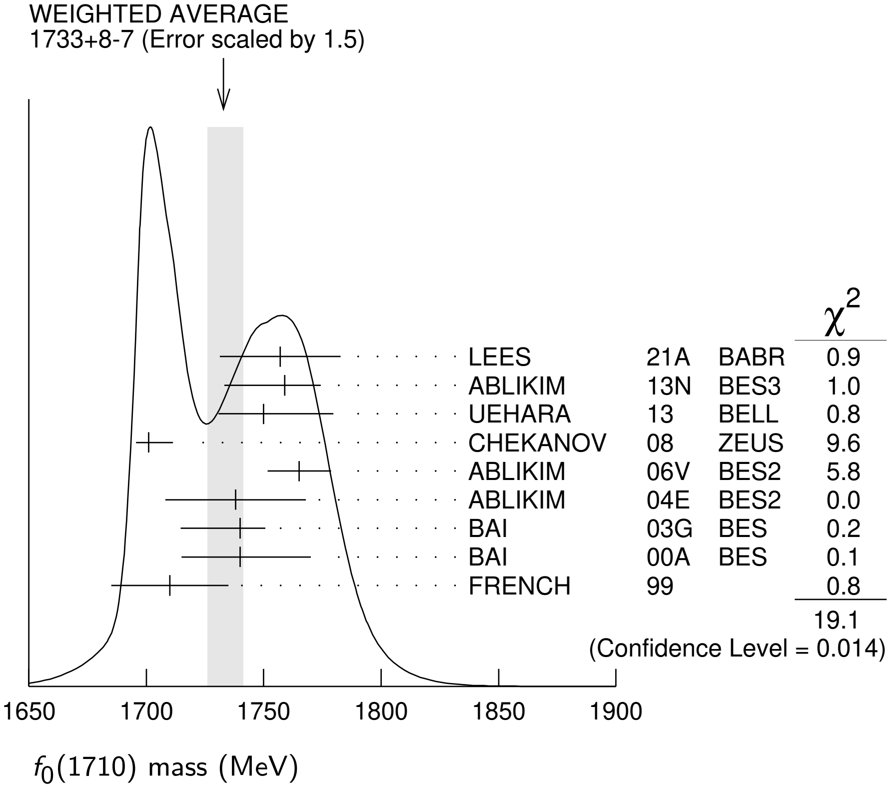
[30] Superseded by ALDE 92D.

[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

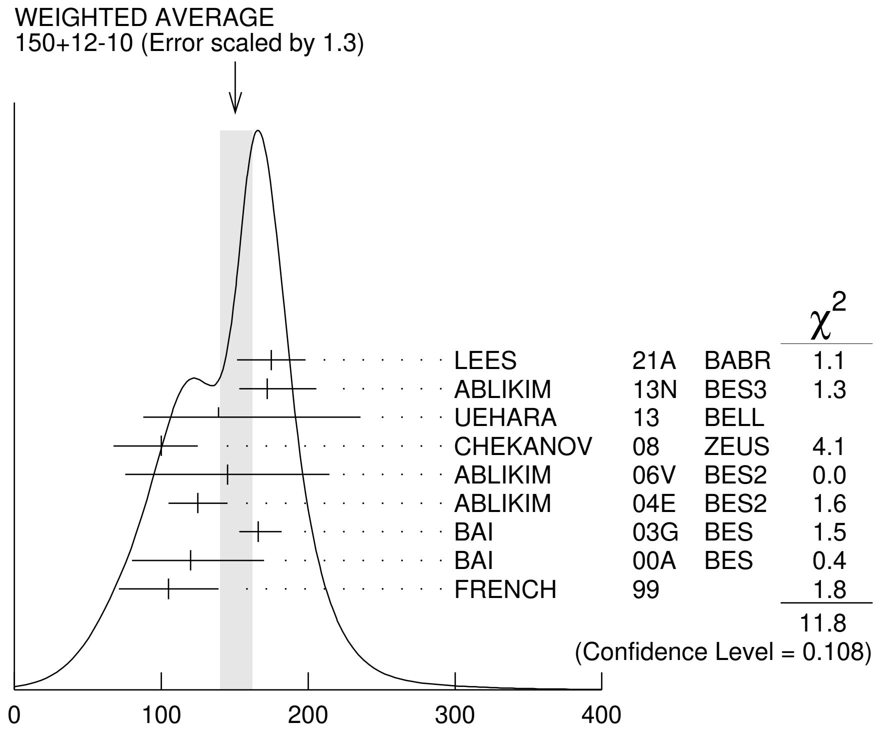
OUR EVALUATION below is based on T-matrix poles from BARBERIS 00E and BARBERIS 99D.

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.				
$175 \pm 23 \pm 4$		[1] LEES	21A BABR	$\eta_c(1S) \to \eta' K^+ K^-$
$172 \pm 10 {}^{+32}_{-16}$	5.5k	[2] ABLIKIM	13N BES3	$e^+ e^- \to J/\psi \to \gamma \eta \eta$
$139 {}^{+11}_{-12} {}^{+96}_{-50}$		[3] UEHARA	13 BELL	$\gamma\gamma \to K^0_S K^0_S$
$100 \pm 24 {}^{+7}_{-22}$	4k	[4] CHEKANOV	08 ZEUS	$e p \to K^0_S K^0_S X$
$145 \pm 8 \pm 69$		[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 $p p \to p_f (K^+ K^-) p_s$

• • • 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	$J/\psi(1S) \to \gamma\ (\pi\pi,\ K\overline{K},\ \eta\eta,\ \omega\phi)$
$289.7 \pm 5.0^{+32.6}_{-19.3}$		[10] ALBRECHT	20	RVUE	$0.9\ \overline{p}p \to \pi^0\pi^0\eta,\ \pi^0\eta\eta,\ \pi^0K^+K^-$
$95 \pm 10^{+78}_{-82}$		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	$J/\psi \to \phi\pi^+\pi^-$
$125 \pm 25^{+10}_{-15}$		[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	0.6–1.2 $p\overline{p} \to \eta\eta\pi^0$
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		$\pi^- p \to K^0_S K^0_S n$
$103 \pm 18^{+30}_{-11}$		[23] BAI	96C	BES	$J/\psi \to \gamma K^+K^-$
$85 \pm 24^{+22}_{-19}$		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	$300\ pp \to ppK^+K^-$
104 ± 30		[27] ARMSTRONG	89D	OMEG	$300\ pp \to ppK^0_S K^0_S$
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	$23\ \pi^- p \to n 2K^0_S$



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[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

$f_0(1710)$ $\Gamma(i)\Gamma(\gamma\gamma)/\Gamma(\text{total})$

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

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.

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

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

[1] Assuming spin 0.

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f_0(1710) BRANCHING RATIOS

$\Gamma(K\overline{K})/\Gamma_{\text{total}}$ 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.

$\Gamma(\eta\eta)/\Gamma_{\text{total}}$ 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.

$\Gamma(\pi\pi)/\Gamma_{\text{total}}$ 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.		
$0.64\pm0.27\ \pm0.18$		LEES 18A	BABR	$\Upsilon(1S) \to \gamma\pi^+\pi^-,$ γK^+K^-
$0.41^{+0.11}_{-0.17}$		ABLIKIM 06V	BES2	$e^+e^- \to J/\psi \to \gamma\pi^+\pi^-$
$0.2\ \pm0.024\pm0.036$		BARBERIS 99D	OMEG	$450\ pp \to K^+K^-,\ \pi^+\pi^-$
0.39 ± 0.14		ARMSTRONG 91	OMEG	$300\ pp \to pp\pi\pi,\ ppK\overline{K}$

• • • 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. • • •

VALUE	*CL%*	*DOCUMENT ID*	*TECN*	*COMMENT*
$0.46^{+0.70}_{-0.38}$		[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 Translated from YAF 69 515.	V.V. Vladimirsky *et al.*	(ITEP, Moscow)
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 Translated from YAF 68 998.	F. Binon *et al.*	
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 Translated from YAF 66 860.	G.D. Tikhomirov *et al.*	

AMSLER	02	EPJ C23 29	C. Amsler *et al.*	
ANISOVICH	02D	PAN 65 1545 Translated from YAF 65 1583.	V.V. Anisovich *et al.*	
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 Translated from UFN 168 481.	V.V. Anisovich *et al.*	
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 Translated from YAF 58 50.	O.N. Baloshin *et al.*	(ITEP)
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 Translated from YAF 54 745.	D.M. Alde *et al.*	(GAM2 Collab.)
ARMSTRONG	91	ZPHY C51 351	T.A. Armstrong *et al.*	(ATHU, BARI, BIRM+)
PROKOSHKIN	91	SPD 36 155 Translated from DANS 316 900.	Y.D. Prokoshkin	(GAM2 and GAM4 Collab.)
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)