

$f_0(1710)$ 

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

See our mini-review in the 2004 edition of this *Review*, Physics Letters **B592** 1 (2004). See also the mini-review on scalar mesons under  $f_0(500)$  (see the index for the page number).

 **$f_0(1710)$  MASS**

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
<b><math>1723^{+6}_{-5}</math></b>	<b>OUR AVERAGE</b>	Error includes scale factor of 1.6. See the ideogram below.		
$1759 \pm 6$	$^{+14}_{-25}$ 5.5k	1 ABLIKIM	13N BES3	$e^+e^- \rightarrow J/\psi \rightarrow \gamma\eta\eta$
$1750^{+6}_{-7}$	$^{+29}_{-18}$	UEHARA	13 BELL	$\gamma\gamma \rightarrow K_S^0 K_S^0$
$1701 \pm 5$	$^{+9}_{-2}$ 4k	2 CHEKANOV	08 ZEUS	$ep \rightarrow K_S^0 K_S^0 X$
$1765^{+4}_{-3}$	$\pm 13$	ABLIKIM	06V BES2	$e^+e^- \rightarrow J/\psi \rightarrow \gamma\pi^+\pi^-$
$1760 \pm 15$	$^{+15}_{-10}$	3 ABLIKIM	05Q BES2	$\psi(2S) \rightarrow \gamma\pi^+\pi^- K^+ K^-$
$1738 \pm 30$		ABLIKIM	04E BES2	$J/\psi \rightarrow \omega K^+ K^-$
$1740 \pm 4$	$^{+10}_{-25}$	4 BAI	03G BES	$J/\psi \rightarrow \gamma K\bar{K}$
$1740^{+30}_{-25}$		4 BAI	00A BES	$J/\psi \rightarrow \gamma(\pi^+\pi^-\pi^+\pi^-)$
$1698 \pm 18$		5 BARBERIS	00E	$450 pp \rightarrow p_f \eta\eta p_S$
$1710 \pm 12$	$\pm 11$	6 BARBERIS	99D OMEG	$450 pp \rightarrow K^+ K^-, \pi^+\pi^-$
$1710 \pm 25$		7 FRENCH	99	$300 pp \rightarrow p_f(K^+ K^-) p_S$
$1707 \pm 10$		8 AUGUSTIN	88 DM2	$J/\psi \rightarrow \gamma K^+ K^-, K_S^0 K_S^0$
$1698 \pm 15$		8 AUGUSTIN	87 DM2	$J/\psi \rightarrow \gamma\pi^+\pi^-$
$1720 \pm 10$	$\pm 10$	9 BALTRUSAIT..87	MRK3	$J/\psi \rightarrow \gamma K^+ K^-$
$1742 \pm 15$		8 WILLIAMS	84 MPSF	$200 \pi^- N \rightarrow 2K_S^0 X$
$1670 \pm 50$		BLOOM	83 CBAL	$J/\psi \rightarrow \gamma 2\eta$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●				
$1744 \pm 7$	$\pm 5$ 381	10,11 DOBBS	15	$J/\psi \rightarrow \gamma\pi^+\pi^-$
$1705 \pm 11$	$\pm 5$ 237	10,11 DOBBS	15	$\psi(2S) \rightarrow \gamma\pi^+\pi^-$
$1706 \pm 4$	$\pm 5$ 1.0k	10,11 DOBBS	15	$J/\psi \rightarrow \gamma K^+ K^-$
$1690 \pm 8$	$\pm 3$ 349	10,11 DOBBS	15	$\psi(2S) \rightarrow \gamma K^+ K^-$
$1750 \pm 13$		AMSLER	06 CBAR	$1.64 \bar{p}p \rightarrow K^+ K^- \pi^0$
$1747 \pm 5$	80k	12,13 UMAN	06 E835	$5.2 \bar{p}p \rightarrow \eta\eta\pi^0$
$1776 \pm 15$		VLADIMIRSK..06	SPEC	$40 \pi^- p \rightarrow K_S^0 K_S^0 n$
$1790^{+40}_{-30}$		3 ABLIKIM	05 BES2	$J/\psi \rightarrow \phi\pi^+\pi^-$
$1670 \pm 20$		12 BINON	05 GAMS	$33 \pi^- p \rightarrow \eta\eta n$
$1726 \pm 7$	74	13 CHEKANOV	04 ZEUS	$ep \rightarrow K_S^0 K_S^0 X$
$1732 \pm 15$		14 ANISOVICH	03 RVUE	
$1682 \pm 16$		TIKHOMIROV	03 SPEC	$40.0 \pi^- C \rightarrow K_S^0 K_S^0 K_L^0 X$
$1670 \pm 26$	3.6k	4,15 NICHITIU	02 OBLX	
$1770 \pm 12$		16,17 ANISOVICH	99B SPEC	$0.6-1.2 p\bar{p} \rightarrow \eta\eta\pi^0$

1730±15		4 BARBERIS	99 OMEG	450 $pp \rightarrow p_s p_f K^+ K^-$
1750±20		4 BARBERIS	99B OMEG	450 $pp \rightarrow p_s p_f \pi^+ \pi^-$
1750±30		18 ANISOVICH	98B RVUE	Compilation
1720±39		BAI	98H BES	$J/\psi \rightarrow \gamma \pi^0 \pi^0$
1775± 1.5	57	19 BARKOV	98	$\pi^- p \rightarrow K_S^0 K_S^0 n$
1690±11		20 ABREU	96C DLPH	$Z^0 \rightarrow K^+ K^- + X$
1696± 5	$\begin{smallmatrix} +9 \\ -34 \end{smallmatrix}$	9 BAI	96C BES	$J/\psi \rightarrow \gamma K^+ K^-$
1781± 8	$\begin{smallmatrix} +10 \\ -31 \end{smallmatrix}$	4 BAI	96C BES	$J/\psi \rightarrow \gamma K^+ K^-$
1768±14		BALOSHIN	95 SPEC	40 $\pi^- C \rightarrow K_S^0 K_S^0 X$
1750±15		21 BUGG	95 MRK3	$J/\psi \rightarrow \gamma \pi^+ \pi^- \pi^+ \pi^-$
1620±16		9 BUGG	95 MRK3	$J/\psi \rightarrow \gamma \pi^+ \pi^- \pi^+ \pi^-$
1748±10		8 ARMSTRONG	93C E760	$\bar{p} p \rightarrow \pi^0 \eta \eta \rightarrow 6\gamma$
~ 1750		BREAKSTONE	93 SFM	$pp \rightarrow p p \pi^+ \pi^- \pi^+ \pi^-$
1744±15		22 ALDE	92D GAM2	38 $\pi^- p \rightarrow \eta \eta n$
1713±10		23 ARMSTRONG	89D OMEG	300 $pp \rightarrow p p K^+ K^-$
1706±10		23 ARMSTRONG	89D OMEG	300 $pp \rightarrow p p K_S^0 K_S^0$
1700±15		9 BOLONKIN	88 SPEC	40 $\pi^- p \rightarrow K_S^0 K_S^0 n$
1720±60		4 BOLONKIN	88 SPEC	40 $\pi^- p \rightarrow K_S^0 K_S^0 n$
1638±10		24 FALVARD	88 DM2	$J/\psi \rightarrow \phi K^+ K^-, K_S^0 K_S^0$
1690± 4		25 FALVARD	88 DM2	$J/\psi \rightarrow \phi K^+ K^-, K_S^0 K_S^0$
1755± 8		26 ALDE	86C GAM2	38 $\pi^- p \rightarrow n 2\eta$
1730 $\begin{smallmatrix} +2 \\ -10 \end{smallmatrix}$		27 LONGACRE	86 RVUE	22 $\pi^- p \rightarrow n 2K_S^0$
1650±50		BURKE	82 MRK2	$J/\psi \rightarrow \gamma 2\rho$
1640±50		28,29 EDWARDS	82D CBAL	$J/\psi \rightarrow \gamma 2\eta$
1730±10 ±20		30 ETKIN	82C MPS	23 $\pi^- p \rightarrow n 2K_S^0$

<sup>1</sup> From partial wave analysis including all possible combinations of  $0^{++}$ ,  $2^{++}$ , and  $4^{++}$  resonances.

<sup>2</sup> 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.

<sup>3</sup> This state may be different from  $f_0(1710)$ , see CLOSE 05.

<sup>4</sup>  $J^P = 0^+$ .

<sup>5</sup> T-matrix pole.

<sup>6</sup> Supersedes BARBERIS 99 and BARBERIS 99B.

<sup>7</sup>  $J^P = 0^+$ , supersedes by ARMSTRONG 89D.

<sup>8</sup> No  $J^{PC}$  determination.

<sup>9</sup>  $J^P = 2^+$ .

<sup>10</sup> Using CLEO-c data but not authored by the CLEO Collaboration.

<sup>11</sup> From a fit to a Breit-Wigner line shape with fixed  $\Gamma = 135$  MeV.

<sup>12</sup> Breit-Wigner mass.

<sup>13</sup> Systematic errors not estimated.

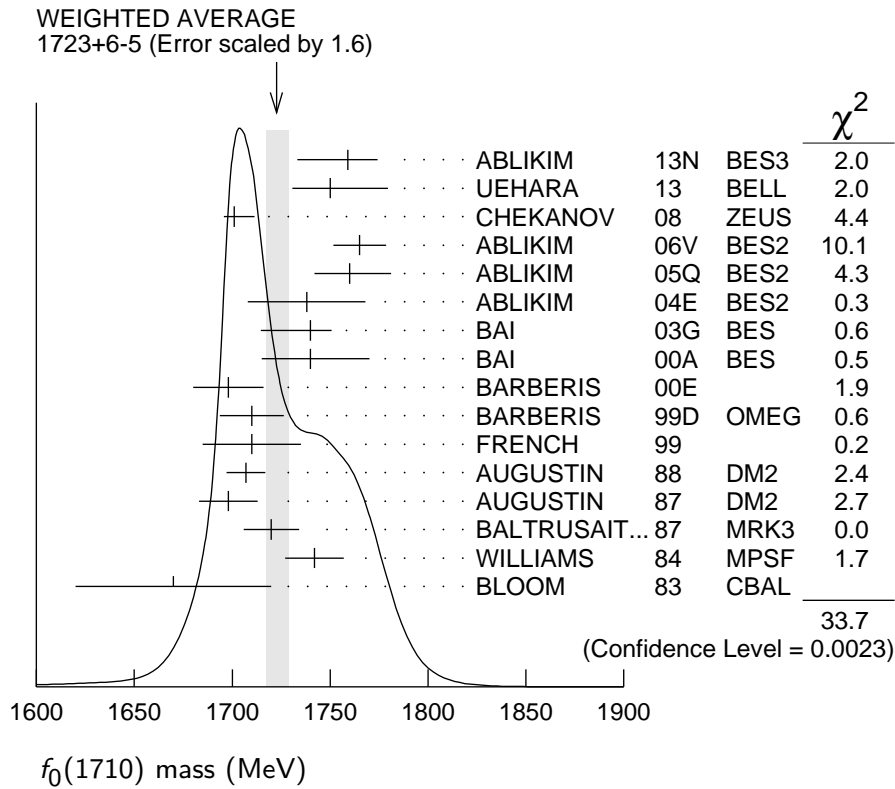
<sup>14</sup> K-matrix pole, assuming  $J^P = 0^+$ , from combined analysis of  $\pi^- p \rightarrow \pi^0 \pi^0 n$ ,  $\pi^- p \rightarrow K \bar{K} n$ ,  $\pi^+ \pi^- \rightarrow \pi^+ \pi^-$ ,  $\bar{p} p \rightarrow \pi^0 \pi^0 \pi^0$ ,  $\pi^0 \eta \eta$ ,  $\pi^0 \pi^0 \eta$ ,  $\pi^+ \pi^- \pi^0$ ,  $K^+ K^- \pi^0$ ,  $K_S^0 K_S^0 \pi^0$ ,  $K^+ K_S^0 \pi^-$  at rest,  $\bar{p} n \rightarrow \pi^- \pi^- \pi^+$ ,  $K_S^0 K^- \pi^0$ ,  $K_S^0 K_S^0 \pi^-$  at rest.

<sup>15</sup> Decaying to  $f_0(1370) \pi \pi$ .

<sup>16</sup>  $J^P = 0^+$ .

<sup>17</sup> Not seen by AMSLER 02.

- 18 T-matrix pole, assuming  $J^P = 0^+$
- 19 No  $J^{PC}$  determination.
- 20 No  $J^{PC}$  determination, width not determined.
- 21 From a fit to the  $0^+$  partial wave.
- 22 ALDE 92D combines all the GAMS-2000 data.
- 23  $J^P = 2^+$ , superseded by FRENCH 99.
- 24 From an analysis ignoring interference with  $f'_2(1525)$ .
- 25 From an analysis including interference with  $f'_2(1525)$ .
- 26 Superseded by ALDE 92D.
- 27 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.
- 28  $J^P = 2^+$  preferred.
- 29 From fit neglecting nearby  $f'_2(1525)$ . Replaced by BLOOM 83.
- 30 Superseded by LONGACRE 86.



### $f_0(1710)$ WIDTH

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
<b>139 ± 8</b>	<b>OUR AVERAGE</b>	Error includes scale factor of 1.1.		
172 ± 10	$^{+32}_{-16}$ 5.5k	1 ABLIKIM	13N BES3	$e^+e^- \rightarrow J/\psi \rightarrow \gamma\eta\eta$
139	$^{+11}_{-12}$ $^{+96}_{-50}$	UEHARA	13 BELL	$\gamma\gamma \rightarrow K_S^0 K_S^0$
100 ± 24	$^{+7}_{-22}$ 4k	2 CHEKANOV	08 ZEUS	$ep \rightarrow K_S^0 K_S^0 X$
145 ± 8	$\pm 69$	ABLIKIM	06V BES2	$e^+e^- \rightarrow J/\psi \rightarrow \gamma\pi^+\pi^-$
125 ± 25	$^{+10}_{-15}$	3 ABLIKIM	05Q BES2	$\psi(2S) \rightarrow \gamma\pi^+\pi^- K^+ K^-$

125 ± 20		ABLIKIM	04E	BES2	$J/\psi \rightarrow \omega K^+ K^-$
166 $\begin{smallmatrix} + 5 \\ - 8 \end{smallmatrix}$ $\begin{smallmatrix} +15 \\ -10 \end{smallmatrix}$		4 BAI	03G	BES	$J/\psi \rightarrow \gamma K \bar{K}$
120 $\begin{smallmatrix} + 50 \\ - 40 \end{smallmatrix}$		4 BAI	00A	BES	$J/\psi \rightarrow \gamma(\pi^+ \pi^- \pi^+ \pi^-)$
120 ± 26		5 BARBERIS	00E		450 $pp \rightarrow p_f \eta \eta p_S$
126 ± 16 ±18		6 BARBERIS	99D	OMEG	450 $pp \rightarrow K^+ K^-, \pi^+ \pi^-$
105 ± 34		7 FRENCH	99		300 $pp \rightarrow p_f(K^+ K^-) p_S$
166.4 ± 33.2		8 AUGUSTIN	88	DM2	$J/\psi \rightarrow \gamma K^+ K^-, K_S^0 K_S^0$
136 ± 28		8 AUGUSTIN	87	DM2	$J/\psi \rightarrow \gamma \pi^+ \pi^-$
130 ± 20		9 BALTRUSAIT..	87	MRK3	$J/\psi \rightarrow \gamma K^+ K^-$
57 ± 38		10 WILLIAMS	84	MPSF	200 $\pi^- N \rightarrow 2K_S^0 X$
160 ± 80		BLOOM	83	CBAL	$J/\psi \rightarrow \gamma 2\eta$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●					
148 $\begin{smallmatrix} + 40 \\ - 30 \end{smallmatrix}$		AMSLER	06	CBAR	1.64 $\bar{p} p \rightarrow K^+ K^- \pi^0$
188 ± 13	80k	3,11 UMAN	06	E835	5.2 $\bar{p} p \rightarrow \eta \eta \pi^0$
250 ± 30		VLADIMIRSK...	06	SPEC	40 $\pi^- p \rightarrow K_S^0 K_S^0 n$
270 $\begin{smallmatrix} + 60 \\ - 30 \end{smallmatrix}$		12 ABLIKIM	05	BES2	$J/\psi \rightarrow \phi \pi^+ \pi^-$
260 ± 50		3 BINON	05	GAMS	33 $\pi^- p \rightarrow \eta \eta n$
38 $\begin{smallmatrix} + 20 \\ - 14 \end{smallmatrix}$	74	11 CHEKANOV	04	ZEUS	$e p \rightarrow K_S^0 K_S^0 X$
144 ± 30	13,14	ANISOVICH	03	RVUE	
320 $\begin{smallmatrix} + 50 \\ - 20 \end{smallmatrix}$	14,15	ANISOVICH	03	RVUE	
102 ± 26		TIKHOMIROV	03	SPEC	40.0 $\pi^- C \rightarrow K_S^0 K_S^0 K_L^0 X$
267 ± 44	3651	4,16 NICHITIU	02	OBLX	
220 ± 40	17,18	ANISOVICH	99B	SPEC	0.6–1.2 $p \bar{p} \rightarrow \eta \eta \pi^0$
100 ± 25	4	BARBERIS	99	OMEG	450 $pp \rightarrow p_S p_f K^+ K^-$
160 ± 30	4	BARBERIS	99B	OMEG	450 $pp \rightarrow p_S p_f \pi^+ \pi^-$
250 ± 140	19	ANISOVICH	98B	RVUE	Compilation
30 ± 7	57	20 BARKOV	98		$\pi^- p \rightarrow K_S^0 K_S^0 n$
103 ± 18 $\begin{smallmatrix} +30 \\ -11 \end{smallmatrix}$		9 BAI	96C	BES	$J/\psi \rightarrow \gamma K^+ K^-$
85 ± 24 $\begin{smallmatrix} +22 \\ -19 \end{smallmatrix}$		4 BAI	96C	BES	$J/\psi \rightarrow \gamma K^+ K^-$
56 ± 19		BALOSHIN	95	SPEC	40 $\pi^- C \rightarrow K_S^0 K_S^0 X$
160 ± 40	21	BUGG	95	MRK3	$J/\psi \rightarrow \gamma \pi^+ \pi^- \pi^+ \pi^-$
160 $\begin{smallmatrix} + 60 \\ - 20 \end{smallmatrix}$	9	BUGG	95	MRK3	$J/\psi \rightarrow \gamma \pi^+ \pi^- \pi^+ \pi^-$
264 ± 25	8	ARMSTRONG	93C	E760	$\bar{p} p \rightarrow \pi^0 \eta \eta \rightarrow 6\gamma$
200 to 300		BREAKSTONE	93	SFM	$pp \rightarrow pp \pi^+ \pi^- \pi^+ \pi^-$
< 80 90% CL	22	ALDE	92D	GAM2	38 $\pi^- p \rightarrow \eta \eta N^*$
181 ± 30	23	ARMSTRONG	89D	OMEG	300 $pp \rightarrow pp K^+ K^-$
104 ± 30	23	ARMSTRONG	89D	OMEG	300 $pp \rightarrow pp K_S^0 K_S^0$
30 ± 20	9	BOLONKIN	88	SPEC	40 $\pi^- p \rightarrow K_S^0 K_S^0 n$
350 ± 150	4	BOLONKIN	88	SPEC	40 $\pi^- p \rightarrow K_S^0 K_S^0 n$
148 ± 17	24	FALVARD	88	DM2	$J/\psi \rightarrow \phi K^+ K^-, K_S^0 K_S^0$
184 ± 6	25	FALVARD	88	DM2	$J/\psi \rightarrow \phi K^+ K^-, K_S^0 K_S^0$

122	+ 74 - 15	26	LONGACRE	86	RVUE	22	$\pi^- p \rightarrow n 2K_S^0$
200	$\pm 100$		BURKE	82	MRK2	$J/\psi \rightarrow \gamma 2\rho$	
220	+100 - 70	27,28	EDWARDS	82D	CBAL	$J/\psi \rightarrow \gamma 2\eta$	
200	+156 - 9	29	ETKIN	82B	MPS	23	$\pi^- p \rightarrow n 2K_S^0$

<sup>1</sup> From partial wave analysis including all possible combinations of  $0^{++}$ ,  $2^{++}$ , and  $4^{++}$  resonances.

<sup>2</sup> 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.

<sup>3</sup> Breit-Wigner width.

<sup>4</sup>  $J^P = 0^+$ .

<sup>5</sup> T-matrix pole.

<sup>6</sup> Supersedes BARBERIS 99 and BARBERIS 99B.

<sup>7</sup>  $J^P = 0^+$ , supersedes by ARMSTRONG 89D.

<sup>8</sup> No  $J^{PC}$  determination.

<sup>9</sup>  $J^P = 2^+$ .

<sup>10</sup> No  $J^{PC}$  determination.

<sup>11</sup> Systematic errors not estimated.

<sup>12</sup> This state may be different from  $f_0(1710)$ , see CLOSE 05.

<sup>13</sup> (Solution I)

<sup>14</sup> K-matrix pole, assuming  $J^P = 0^+$ , from combined analysis of  $\pi^- p \rightarrow \pi^0 \pi^0 n$ ,  $\pi^- p \rightarrow K \bar{K} n$ ,  $\pi^+ \pi^- \rightarrow \pi^+ \pi^-$ ,  $\bar{p} p \rightarrow \pi^0 \pi^0 \pi^0$ ,  $\pi^0 \eta \eta$ ,  $\pi^0 \pi^0 \eta$ ,  $\pi^+ \pi^- \pi^0$ ,  $K^+ K^- \pi^0$ ,  $K_S^0 K_S^0 \pi^0$ ,  $K^+ K_S^0 \pi^-$  at rest,  $\bar{p} n \rightarrow \pi^- \pi^- \pi^+$ ,  $K_S^0 K^- \pi^0$ ,  $K_S^0 K_S^0 \pi^-$  at rest.

<sup>15</sup> (Solution I)

<sup>16</sup> Decaying to  $f_0(1370) \pi \pi$ .

<sup>17</sup>  $J^P = 0^+$ .

<sup>18</sup> Not seen by AMSLER 02.

<sup>19</sup> T-matrix pole, assuming  $J^P = 0^+$

<sup>20</sup> No  $J^{PC}$  determination.

<sup>21</sup> From a fit to the  $0^+$  partial wave.

<sup>22</sup> ALDE 92D combines all the GAMS-2000 data.

<sup>23</sup>  $J^P = 2^+$ , ( $0^+$  excluded).

<sup>24</sup> From an analysis ignoring interference with  $f_2'(1525)$ .

<sup>25</sup> From an analysis including interference with  $f_2'(1525)$ .

<sup>26</sup> 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.

<sup>27</sup>  $J^P = 2^+$  preferred.

<sup>28</sup> From fit neglecting nearby  $f_2'(1525)$ . Replaced by BLOOM 83.

<sup>29</sup> From an amplitude analysis of the  $K_S^0 K_S^0$  system, superseded by LONGACRE 86.

### $f_0(1710)$ DECAY MODES

Mode	Fraction ( $\Gamma_i/\Gamma$ )
$\Gamma_1$ $K \bar{K}$	seen
$\Gamma_2$ $\eta \eta$	seen
$\Gamma_3$ $\pi \pi$	seen
$\Gamma_4$ $\gamma \gamma$	
$\Gamma_5$ $\omega \omega$	seen

$f_0(1710) \Gamma(i)\Gamma(\gamma\gamma)/\Gamma(\text{total})$  $\Gamma(K\bar{K}) \times \Gamma(\gamma\gamma)/\Gamma_{\text{total}}$   $\Gamma_1\Gamma_4/\Gamma$ 

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

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

<480	95	ALBRECHT	90G	ARG $\gamma\gamma \rightarrow K^+ K^-$
<110	95	<sup>1</sup> BEHREND	89C	CELL $\gamma\gamma \rightarrow K_S^0 K_S^0$
<280	95	<sup>1</sup> ALTHOFF	85B	TASS $\gamma\gamma \rightarrow K\bar{K}\pi$

<sup>1</sup> 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	<sup>1</sup> BARATE	00E	ALEP $\gamma\gamma \rightarrow \pi^+ \pi^-$

<sup>1</sup> Assuming spin 0.

 $f_0(1710)$  BRANCHING RATIOS $\Gamma(K\bar{K})/\Gamma_{\text{total}}$   $\Gamma_1/\Gamma$ 

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
seen	1004	<sup>1</sup> DOBBS	15	$J/\psi \rightarrow \gamma K^+ K^-$
seen	349	<sup>1</sup> DOBBS	15	$\psi(2S) \rightarrow \gamma K^+ K^-$
$0.36 \pm 0.12$		ALBALADEJO	08	RVUE
$0.38^{+0.09}_{-0.19}$		<sup>2</sup> LONGACRE	86	MPS $22 \pi^- p \rightarrow n 2K_S^0$

<sup>1</sup> Using CLEO-c data but not authored by the CLEO Collaboration.

<sup>2</sup> From a partial-wave analysis of data using a K-matrix formalism with 5 poles, but assuming spin 2. Fit with constrained inelasticity.

 $\Gamma(\eta\eta)/\Gamma_{\text{total}}$   $\Gamma_2/\Gamma$ 

VALUE	DOCUMENT ID	TECN
$0.22 \pm 0.12$	ALBALADEJO	08
$0.18^{+0.03}_{-0.13}$	<sup>1</sup> LONGACRE	86

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

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

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
seen	381	<sup>1</sup> DOBBS	15	$J/\psi \rightarrow \gamma \pi^+ \pi^-$
seen	237	<sup>1</sup> DOBBS	15	$\psi(2S) \rightarrow \gamma \pi^+ \pi^-$
not seen		AMSLER	02	CBAR $0.9 \bar{p} p \rightarrow \pi^0 \eta \eta, \pi^0 \pi^0 \pi^0$
$0.039^{+0.002}_{-0.024}$		<sup>2</sup> LONGACRE	86	RVUE

<sup>1</sup> Using CLEO-c data but not authored by the CLEO Collaboration.

<sup>2</sup> From a partial-wave analysis of data using a K-matrix formalism with 5 poles, but assuming spin 2. Fit with constrained inelasticity.

$\Gamma(\pi\pi)/\Gamma(K\bar{K})$  $\Gamma_3/\Gamma_1$ 

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<b>0.41<sup>+0.11</sup><sub>-0.17</sub></b>		ABLIKIM	06V BES2	$e^+e^- \rightarrow J/\psi \rightarrow \gamma\pi^+\pi^-$
0.32±0.14		ALBALADEJO	08 RVUE	
< 0.11	95	<sup>1</sup> ABLIKIM	04E BES2	$J/\psi \rightarrow \omega K^+ K^-$
5.8 <sup>+9.1</sup> <sub>-5.5</sub>		<sup>2</sup> ANISOVICH	02D SPEC	Combined fit
0.2 ±0.024±0.036		BARBERIS	99D OMEG 450	$pp \rightarrow K^+ K^-, \pi^+ \pi^-$
0.39±0.14		ARMSTRONG	91 OMEG 300	$pp \rightarrow pp\pi\pi, ppK\bar{K}$

<sup>1</sup> Using data from ABLIKIM 04A.<sup>2</sup> From a combined K-matrix analysis of Crystal Barrel ( $0. p\bar{p} \rightarrow \pi^0\pi^0\pi^0, \pi^0\eta\eta, \pi^0\pi^0\eta$ ), GAMS ( $\pi p \rightarrow \pi^0\pi^0 n, \eta\eta n, \eta\eta' n$ ), and BNL ( $\pi p \rightarrow K\bar{K}n$ ) data. $\Gamma(\eta\eta)/\Gamma(K\bar{K})$  $\Gamma_2/\Gamma_1$ 

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<b>0.48±0.15</b>		BARBERIS	00E	450 $pp \rightarrow p_f\eta\eta p_S$

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

0.46 <sup>+0.70</sup> <sub>-0.38</sub>		<sup>1</sup> ANISOVICH	02D SPEC	Combined fit
< 0.02	90	<sup>2</sup> PROKOSHKIN	91 GA24	300 $\pi^- p \rightarrow \pi^- p\eta\eta$

<sup>1</sup> From a combined K-matrix analysis of Crystal Barrel ( $0. p\bar{p} \rightarrow \pi^0\pi^0\pi^0, \pi^0\eta\eta, \pi^0\pi^0\eta$ ), GAMS ( $\pi p \rightarrow \pi^0\pi^0 n, \eta\eta n, \eta\eta' n$ ), and BNL ( $\pi p \rightarrow K\bar{K}n$ ) data.<sup>2</sup> Combining results of GAM4 with those of ARMSTRONG 89D. $\Gamma(\omega\omega)/\Gamma_{\text{total}}$  $\Gamma_5/\Gamma$ 

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
<b>seen</b>	180	ABLIKIM	06H BES	$J/\psi \rightarrow \gamma\omega\omega$

 $f_0(1710)$  REFERENCES

DOBBS	15	PR D91 052006	S. Dobbs <i>et al.</i>	(NWES)
ABLIKIM	13N	PR D87 092009	Ablikim M. <i>et al.</i>	(BES III Collab.)
UEHARA	13	PTEP 2013 123C01	S. Uehara <i>et al.</i>	(BELLE Collab.)
ALBALADEJO	08	PRL 101 252002	M. Albaladejo, J.A. Oller	
CHEKANOV	08	PRL 101 112003	S. Chekanov <i>et al.</i>	(ZEUS Collab.)
ABLIKIM	06H	PR D73 112007	M. Ablikim <i>et al.</i>	(BES Collab.)
ABLIKIM	06V	PL B642 441	M. Ablikim <i>et al.</i>	(BES Collab.)
AMSLER	06	PL B639 165	C. Amsler <i>et al.</i>	(CBAR Collab.)
UMAN	06	PR D73 052009	I. Uman <i>et al.</i>	(FNAL E835)
VLADIMIRSK...	06	PAN 69 493	V.V. Vladimirovsky <i>et al.</i>	(ITEP, Moscow)
		Translated from YAF 69 515.		
ABLIKIM	05	PL B607 243	M. Ablikim <i>et al.</i>	(BES Collab.)
ABLIKIM	05Q	PR D72 092002	M. Ablikim <i>et al.</i>	(BES Collab.)
BINON	05	PAN 68 960	F. Binon <i>et al.</i>	
		Translated from YAF 68 998.		
CLOSE	05	PR D71 094022	F.E. Close, Q. Zhao	
ABLIKIM	04A	PL B598 149	M. Ablikim <i>et al.</i>	(BES Collab.)
ABLIKIM	04E	PL B603 138	M. Ablikim <i>et al.</i>	(BES Collab.)
CHEKANOV	04	PL B578 33	S. Chekanov <i>et al.</i>	(ZEUS Collab.)
PDG	04	PL B592 1	S. Eidelman <i>et al.</i>	(PDG Collab.)
ANISOVICH	03	EPJ A16 229	V.V. Anisovich <i>et al.</i>	
BAI	03G	PR D68 052003	J.Z. Bai <i>et al.</i>	(BES Collab.)
TIKHOMIROV	03	PAN 66 828	G.D. Tikhomirov <i>et al.</i>	
		Translated from YAF 66 860.		

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