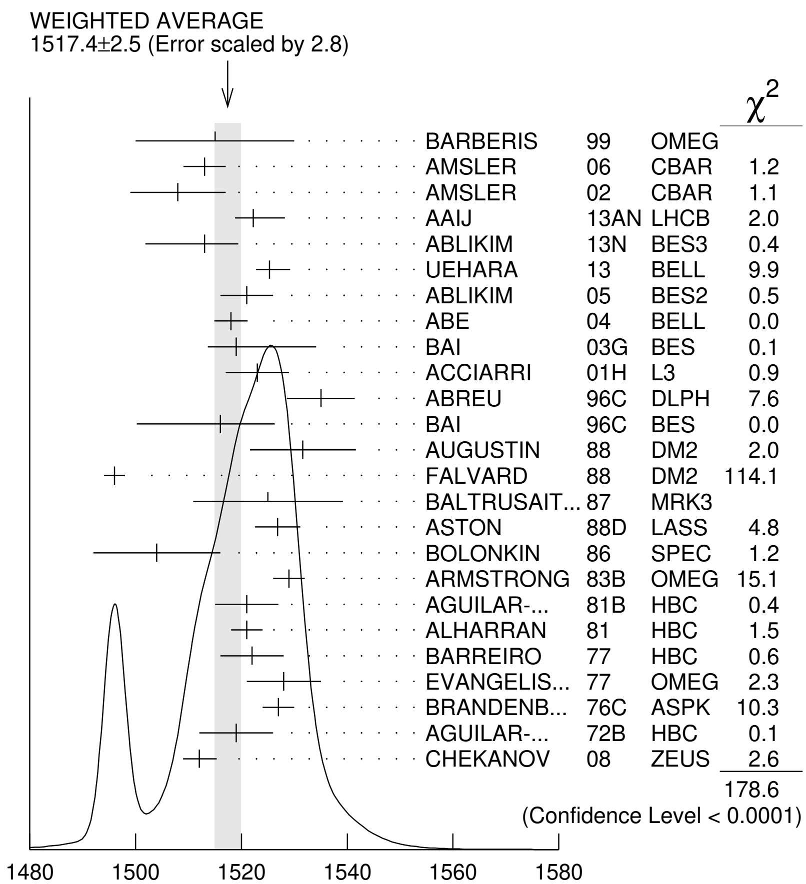
# $f'_2(1525)$

$I^G(J^{PC}) = 0^+(2^{++})$

## $f'_2(1525)$ MASS

| VALUE (MeV) | DOCUMENT ID |
|---|---|

**1517.4±2.5 OUR AVERAGE** Includes data from the 6 datablocks that follow this one. Error includes scale factor of 2.8. See the ideogram below.




$f'_2(1525)$ MASS (MeV)

## PRODUCED BY PION BEAM

| VALUE (MeV) | EVTS | DOCUMENT ID | TECN | COMMENT |
|---|---|---|---|---|

The data in this block is included in the average printed for a previous datablock.

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

| | | | | | |
|---|---|---|---|---|---|
| $1521 \pm 13$ | | TIKHOMIROV | 03 | SPEC | $40.0\ \pi^- \mathrm{C} \to K^0_S K^0_S K^0_L X$ |
| $1547^{+10}_{-2}$ | | [1] LONGACRE | 86 | MPS | $22\ \pi^- p \to K^0_S K^0_S n$ |
| $1496^{+9}_{-8}$ | | [2] CHABAUD | 81 | ASPK | $6\ \pi^- p \to K^+ K^- n$ |
| $1497^{+8}_{-9}$ | | CHABAUD | 81 | ASPK | $18.4\ \pi^- p \to K^+ K^- n$ |
| $1492 \pm 29$ | | GORLICH | 80 | ASPK | $17\ \pi^- p$ polarized $\to K^+ K^- n$ |

| | | | | | |
|---|---|---|---|---|---|
| 1502±25 | | [3] CORDEN | 79 | OMEG | 12–15 $\pi^- p \to \pi^+ \pi^- n$ |
| 1480 | 14 | CRENNELL | 66 | HBC | 6.0 $\pi^- p \to K^0_S K^0_S n$ |

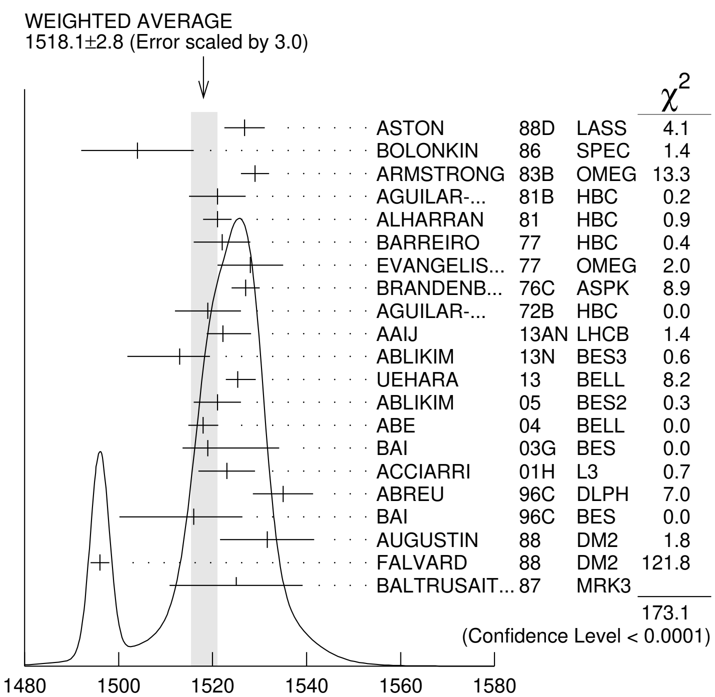
[1] From a partial-wave analysis of data using a K-matrix formalism with 5 poles.
[2] CHABAUD 81 is a reanalysis of PAWLICKI 77 data.
[3] From an amplitude analysis where the $f'_2(1525)$ width and elasticity are in complete disagreement with the values obtained from $K\overline{K}$ channel, making the solution dubious.

## PRODUCED BY $K^{\pm}$ BEAM

The data in this block is included in the average printed for a previous datablock.

**1518.1± 2.8 OUR AVERAGE** Includes data from the datablock that follows this one. Error includes scale factor of 3.0. See the ideogram below.

| VALUE (MeV) | EVTS | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|---|
| 1526.8± 4.3 | | ASTON | 88D | LASS | 11 $K^- p \to K^0_S K^0_S \Lambda$ |
| 1504 ±12 | | BOLONKIN | 86 | SPEC | 40 $K^- p \to K^0_S K^0_S Y$ |
| 1529 ± 3 | | ARMSTRONG | 83B | OMEG | 18.5 $K^- p \to K^- K^+ \Lambda$ |
| 1521 ± 6 | 650 | AGUILAR-... | 81B | HBC | 4.2 $K^- p \to \Lambda K^+ K^-$ |
| 1521 ± 3 | 572 | ALHARRAN | 81 | HBC | 8.25 $K^- p \to \Lambda K \overline{K}$ |
| 1522 ± 6 | 123 | BARREIRO | 77 | HBC | 4.15 $K^- p \to \Lambda K^0_S K^0_S$ |
| 1528 ± 7 | 166 | EVANGELIS... | 77 | OMEG | 10 $K^- p \to K^+ K^- (\Lambda, \Sigma)$ |
| 1527 ± 3 | 120 | BRANDENB... | 76C | ASPK | 13 $K^- p \to K^+ K^- (\Lambda, \Sigma)$ |
| 1519 ± 7 | 100 | AGUILAR-... | 72B | HBC | 3.9,4.6 $K^- p \to K \overline{K} (\Lambda, \Sigma)$ |
| • • • We do not use the following data for averages, fits, limits, etc. • • • | | | | | |
| 1514 ± 8 | 61 | BINON | 07 | GAMS | 32.5 $K^- p \to \eta\eta(\Lambda/\Sigma^0)$ |
| 1513 ±10 | | [1] BARKOV | 99 | SPEC | 40 $K^- p \to K^0_S K^0_S y$ |




PRODUCED BY $K^{\pm}$ BEAM (MeV)

[1] Systematic errors not estimated.

## PRODUCED IN $e^+e^-$ ANNIHILATION AND PARTICLE DECAYS

| VALUE (MeV) | EVTS | DOCUMENT ID | TECN | COMMENT |
|---|---|---|---|---|

The data in this block is included in the average printed for a previous datablock.

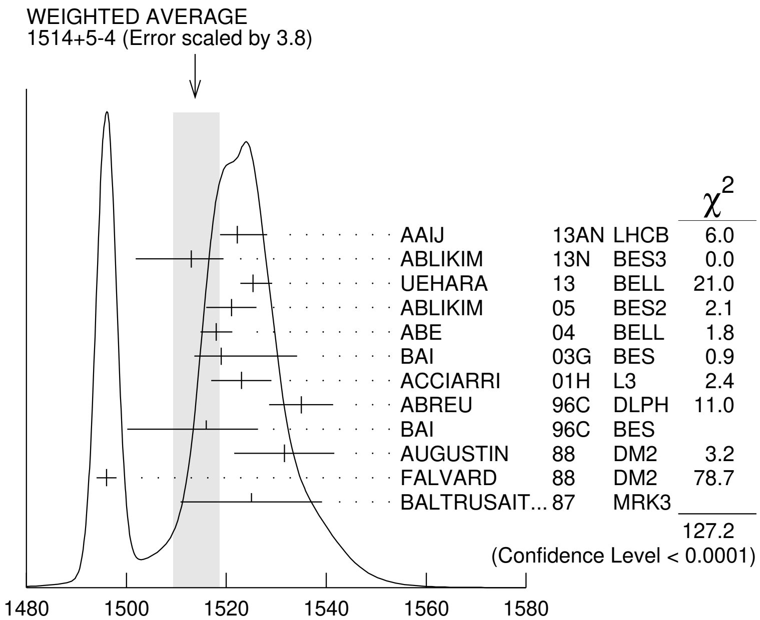
**$1514^{+5}_{-4}$ OUR AVERAGE** Error includes scale factor of 3.8. See the ideogram below.

| VALUE (MeV) | EVTS | DOCUMENT ID | TECN | COMMENT |
|---|---|---|---|---|
| $1522.2 \pm 2.8^{+5.3}_{-2.0}$ | | AAIJ 13AN | LHCB | $\overline{B}^0_s \to J/\psi K^+K^-$ |
| $1513 \pm 5^{+4}_{-10}$ | 5.5k | [1] ABLIKIM 13N | BES3 | $e^+e^- \to J/\psi \to \gamma\eta\eta$ |
| $1525.3^{+1.2}_{-1.4}{}^{+3.7}_{-2.1}$ | | UEHARA 13 | BELL | $\gamma\gamma \to K^0_S K^0_S$ |
| $1521 \pm 5$ | | ABLIKIM 05 | BES2 | $J/\psi \to \phi K^+K^-$ |
| $1518 \pm 1 \pm 3$ | | ABE 04 | BELL | $10.6\ e^+e^- \to e^+e^- K^+K^-$ |
| $1519 \pm 2^{+15}_{-5}$ | | BAI 03G | BES | $J/\psi \to \gamma K\overline{K}$ |
| $1523 \pm 6$ | 331 | [2] ACCIARRI 01H | L3 | 91, 183–209 $e^+e^- \to e^+e^- K^0_S K^0_S$ |
| $1535 \pm 5 \pm 4$ | | ABREU 96C | DLPH | $Z^0 \to K^+K^- + X$ |
| $1516 \pm 5^{+9}_{-15}$ | | BAI 96C | BES | $J/\psi \to \gamma K^+K^-$ |
| $1531.6 \pm 10.0$ | | AUGUSTIN 88 | DM2 | $J/\psi \to \gamma K^+K^-$ |
| $1496 \pm 2$ | | [3] FALVARD 88 | DM2 | $J/\psi \to \phi K^+K^-$ |
| $1525 \pm 10 \pm 10$ | | BALTRUSAIT...87 | MRK3 | $J/\psi \to \gamma K^+K^-$ |

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

| VALUE (MeV) | EVTS | DOCUMENT ID | TECN | COMMENT |
|---|---|---|---|---|
| $1518 \pm 3$ | | [4] KLEMPT 22 | RVUE | $J/\psi(1S) \to \gamma\pi^0\pi^0$, $\gamma K^0_S K^0_S$ |
| $1503 \pm 11$ | | [5] RODAS 22 | RVUE | $J/\psi(1S) \to \gamma\ (\pi\pi,\ K\overline{K})$ |
| $1532 \pm 3 \pm 6$ | 644 | [6,7] DOBBS 15 | | $J/\psi \to \gamma K^+K^-$ |
| $1557 \pm 9 \pm 3$ | 113 | [6,7] DOBBS 15 | | $\psi(2S) \to \gamma K^+K^-$ |
| $1526 \pm 7$ | 29 | [8] LEES 14H | BABR | $e^+e^- \to K^0_S K^0_S K^+K^-\gamma$ |
| $1523 \pm 5$ | 870 | [9] SCHEGELSKY 06A | RVUE | $\gamma\gamma \to K^0_S K^0_S$ |
| $1515 \pm 5$ | | [10] FALVARD 88 | DM2 | $J/\psi \to \phi K^+K^-$ |

[1] From partial wave analysis including all possible combinations of $0^{++}$, $2^{++}$, and $4^{++}$ resonances.
[2] Supersedes ACCIARRI 95J.
[3] From an analysis including interference with $f_0(1710)$.
[4] Fit of the tensor partial waves from BES3 in the multipole basis.
[5] 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).
[6] Using CLEO-c data but not authored by the CLEO Collaboration.
[7] From a fit to a Breit-Wigner line shape with fixed $\Gamma = 73$ MeV.
[8] From a fit to a Breit-Wigner line shape plus a second-order polynomial function. Systematic errors not evaluated.
[9] From analysis of L3 data at 91 and 183–209 GeV.
[10] From an analysis ignoring interference with $f_0(1710)$.




$f_2'(1525)$ mass, $e^+e^-$ annihilation and particle decays (MeV)

## PRODUCED IN $\overline{p}p$ ANNIHILATION

| VALUE (MeV) | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|
| The data in this block is included in the average printed for a previous datablock. | | | | |
| **1512 ± 4 OUR AVERAGE** | | | | |
| 1513 ± 4 | AMSLER | 06 | CBAR | 0.9 $\overline{p}p \to K^+K^-\pi^0$ |
| 1508 ± 9 | [1] AMSLER | 02 | CBAR | 0.9 $\overline{p}p \to \pi^0\eta\eta$, $\pi^0\pi^0\pi^0$ |
| • • • We do not use the following data for averages, fits, limits, etc. • • • | | | | |
| 1495.0 ± 1.1 ± 8.1 | [2] ALBRECHT | 20 | RVUE | 0.9 $\overline{p}p \to \pi^0\pi^0\eta$, $\pi^0\eta\eta$, $\pi^0K^+K^-$ |
| 1530 ± 12 | [3] ANISOVICH | 09 | RVUE | 0.0 $\overline{p}p$, $\pi N$ |

[1] T-matrix pole.
[2] T-matrix pole, 4 poles, 4 channels, including scattering data from HYAMS 75 ($\pi\pi$), LONGACRE 86 ($K\overline{K}$), BINON 83 ($\eta\eta$).
[3] 4-poles, 5-channel K matrix fit.

## CENTRAL PRODUCTION

| VALUE (MeV) | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|
| The data in this block is included in the average printed for a previous datablock. | | | | |
| **1515±15** | BARBERIS | 99 | OMEG | 450 $pp \to p_s p_f K^+K^-$ |

## PRODUCED IN $ep$ COLLISIONS

| VALUE (MeV) | EVTS | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|---|
| The data in this block is included in the average printed for a previous datablock. | | | | | |
| **$1512\pm3^{+1.4}_{-0.5}$** | | [1] CHEKANOV | 08 | ZEUS | $ep \to K^0_S K^0_S X$ |

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

| | | | | | |
|---|---|---|---|---|---|
| $1537^{+9}_{-8}$ | 84 | [2] CHEKANOV | 04 | ZEUS | $e p \to K^0_S K^0_S X$ |

[1] 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.
[2] Systematic errors not estimated.

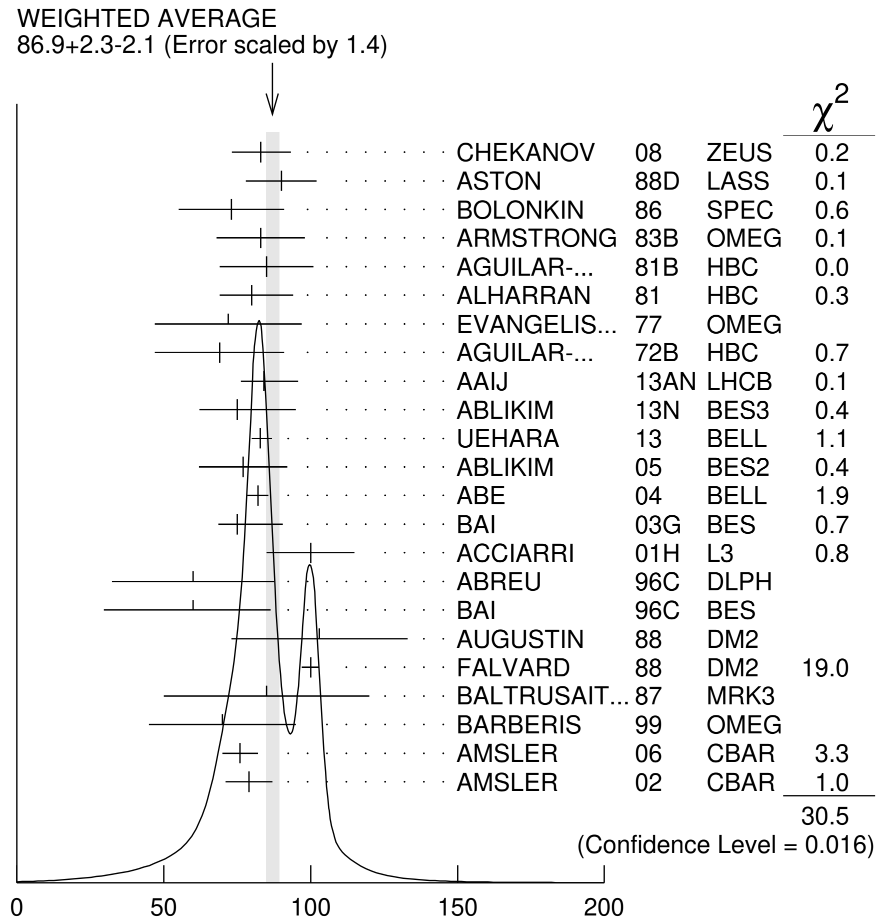
## $f'_2(1525)$ WIDTH

| *VALUE* (MeV) | *DOCUMENT ID* | | *COMMENT* |
|---|---|---|---|
| **86 ±5 OUR FIT** Error includes scale factor of 2.2. | | | |
| $\mathbf{86.9^{+2.3}_{-2.1}}$ | PDG | 18 | Average of width measurements |

## PRODUCED BY PION BEAM

| *VALUE* (MeV) | *DOCUMENT ID* | | *TECN* | *COMMENT* |
|---|---|---|---|---|
| $\mathbf{86.9^{+2.3}_{-2.1}}$ **OUR AVERAGE** Includes data from the 5 datablocks that follow this one. Error includes scale factor of 1.4. See the ideogram below. | | | | |
| • • • We do not use the following data for averages, fits, limits, etc. • • • | | | | |
| 102 ±42 | TIKHOMIROV | 03 | SPEC | $40.0\ \pi^- \mathrm{C} \to K^0_S K^0_S K^0_L \mathrm{X}$ |
| $108^{+5}_{-2}$ | [1] LONGACRE | 86 | MPS | $22\ \pi^- p \to K^0_S K^0_S n$ |
| $69^{+22}_{-16}$ | [2] CHABAUD | 81 | ASPK | $6\ \pi^- p \to K^+ K^- n$ |
| $137^{+23}_{-21}$ | CHABAUD | 81 | ASPK | $18.4\ \pi^- p \to K^+ K^- n$ |
| $150^{+83}_{-50}$ | GORLICH | 80 | ASPK | $17\ \pi^- p$polarized $\to K^+ K^- n$ |
| 165 ±42 | [3] CORDEN | 79 | OMEG | 12–15 $\pi^- p \to \pi^+ \pi^- n$ |
| $92^{+39}_{-22}$ | [4] POLYCHRO... | 79 | STRC | $7\ \pi^- p \to n K^0_S K^0_S$ |

[1] From a partial-wave analysis of data using a K-matrix formalism with 5 poles.
[2] CHABAUD 81 is a reanalysis of PAWLICKI 77 data.
[3] From an amplitude analysis where the $f'_2(1525)$ width and elasticity are in complete disagreement with the values obtained from $K\overline{K}$ channel, making the solution dubious.
[4] From a fit to the $D$ with $f_2(1270)$-$f'_2(1525)$ interference. Mass fixed at 1516 MeV.




$f'_2(1525)$ WIDTH (MeV)

## PRODUCED BY $K^{\pm}$ BEAM

| VALUE (MeV) | EVTS | DOCUMENT ID | TECN | COMMENT |
|---|---|---|---|---|
| The data in this block is included in the average printed for a previous datablock. | | | | |
| **82± 6 OUR AVERAGE** | | | | |
| 90±12 | | ASTON | 88D | LASS | 11 $K^- p \to K^0_S K^0_S \Lambda$ |
| 73±18 | | BOLONKIN | 86 | SPEC | 40 $K^- p \to K^0_S K^0_S Y$ |
| 83±15 | | ARMSTRONG | 83B | OMEG | 18.5 $K^- p \to K^- K^+ \Lambda$ |
| 85±16 | 650 | AGUILAR-... | 81B | HBC | 4.2 $K^- p \to \Lambda K^+ K^-$ |
| $80^{+14}_{-11}$ | 572 | ALHARRAN | 81 | HBC | 8.25 $K^- p \to \Lambda K \overline{K}$ |
| 72±25 | 166 | EVANGELIS... | 77 | OMEG | 10 $K^- p \to K^+ K^- (\Lambda, \Sigma)$ |
| 69±22 | 100 | AGUILAR-... | 72B | HBC | 3.9,4.6 $K^- p \to K \overline{K} (\Lambda, \Sigma)$ |
| • • • We do not use the following data for averages, fits, limits, etc. • • • | | | | |
| $92^{+25}_{-16}$ | 61 | BINON | 07 | GAMS | 32.5 $K^- p \to \eta\eta(\Lambda/\Sigma^0)$ |
| 75±20 | | [1] BARKOV | 99 | SPEC | 40 $K^- p \to K^0_S K^0_S y$ |
| $62^{+19}_{-14}$ | 123 | BARREIRO | 77 | HBC | 4.15 $K^- p \to \Lambda K^0_S K^0_S$ |
| 61± 8 | 120 | BRANDENB... | 76C | ASPK | 13 $K^- p \to K^+ K^- (\Lambda, \Sigma)$ |

[1] Systematic errors not estimated.

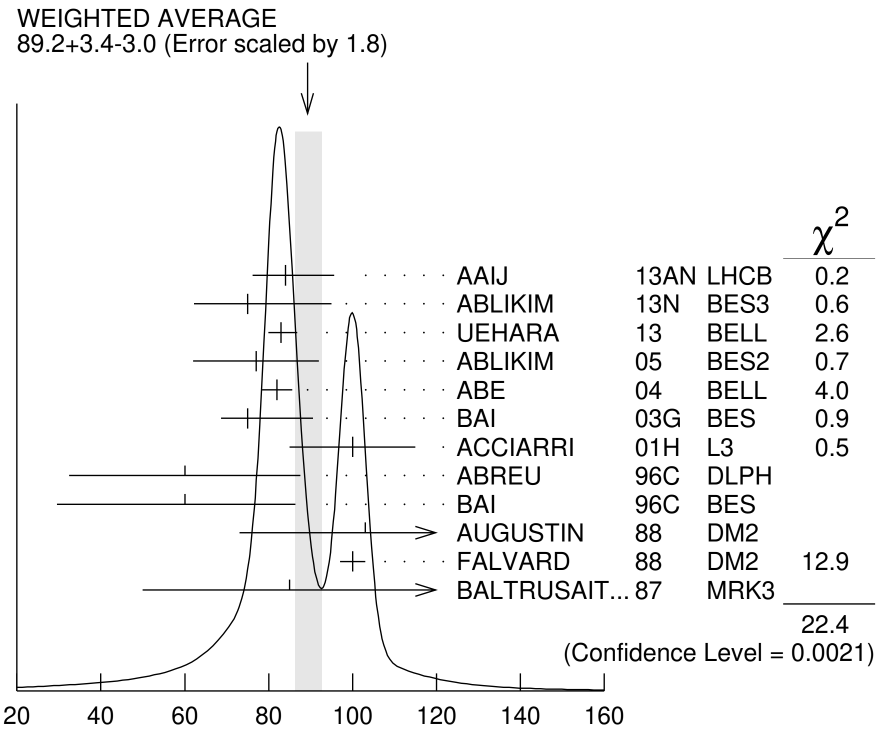
## PRODUCED IN $e^+e^-$ ANNIHILATION AND PARTICLE DECAYS

| VALUE (MeV) | EVTS | DOCUMENT ID | TECN | COMMENT |
|---|---|---|---|---|

The data in this block is included in the average printed for a previous datablock.

| VALUE (MeV) | EVTS | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|---|
| **$89.2^{+3.4}_{-3.0}$ OUR AVERAGE** Error includes scale factor of 1.8. See the ideogram below. | | | | | |
| $84 \pm 6 ^{+10}_{-5}$ | | AAIJ | 13AN | LHCB | $\overline{B}^0_s \to J/\psi K^+ K^-$ |
| $75 ^{+12}_{-10} ^{+16}_{-8}$ | 5.5k | [1] ABLIKIM | 13N | BES3 | $e^+e^- \to J/\psi \to \gamma\eta\eta$ |
| $82.9 ^{+2.1}_{-2.2} ^{+3.3}_{-2.0}$ | | UEHARA | 13 | BELL | $\gamma\gamma \to K^0_S K^0_S$ |
| $77 \pm 15$ | | ABLIKIM | 05 | BES2 | $J/\psi \to \phi K^+ K^-$ |
| $82 \pm 2 \pm 3$ | | ABE | 04 | BELL | 10.6 $e^+e^- \to e^+e^- K^+ K^-$ |
| $75 \pm 4 ^{+15}_{-5}$ | | BAI | 03G | BES | $J/\psi \to \gamma K \overline{K}$ |
| $100 \pm 15$ | 331 | [2] ACCIARRI | 01H | L3 | 91, 183–209 $e^+e^- \to e^+e^- K^0_S K^0_S$ |
| $60 \pm 20 \pm 19$ | | ABREU | 96C | DLPH | $Z^0 \to K^+ K^- + X$ |
| $60 \pm 23 ^{+13}_{-20}$ | | BAI | 96C | BES | $J/\psi \to \gamma K^+ K^-$ |
| $103 \pm 30$ | | AUGUSTIN | 88 | DM2 | $J/\psi \to \gamma K^+ K^-$ |
| $100 \pm 3$ | | [3] FALVARD | 88 | DM2 | $J/\psi \to \phi K^+ K^-$ |
| $85 \pm 35$ | | BALTRUSAIT... | 87 | MRK3 | $J/\psi \to \gamma K^+ K^-$ |
| • • • We do not use the following data for averages, fits, limits, etc. • • • | | | | | |
| $78 \pm 6$ | | [4] KLEMPT | 22 | RVUE | $J/\psi(1S) \to \gamma\pi^0\pi^0, \gamma K^0_S K^0_S$ |
| $84 \pm 15$ | | [5] RODAS | 22 | RVUE | $J/\psi(1S) \to \gamma (\pi\pi, K\overline{K})$ |
| $37 \pm 12$ | 29 | [6] LEES | 14H | BABR | $e^+e^- \to K^0_S K^0_S K^+ K^- \gamma$ |
| $104 \pm 10$ | 870 | [7] SCHEGELSKY | 06A | RVUE | $\gamma\gamma \to K^0_S K^0_S$ |
| $62 \pm 10$ | | [8] FALVARD | 88 | DM2 | $J/\psi \to \phi K^+ K^-$ |

[1] From partial wave analysis including all possible combinations of $0^{++}$, $2^{++}$, and $4^{++}$ resonances.
[2] Supersedes ACCIARRI 95J.
[3] From an analysis including interference with $f_0(1710)$.
[4] Fit of the tensor partial waves from BES3 in the multipole basis.
[5] 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).
[6] From a fit to a Breit-Wigner line shape plus a second-order polynomial function. Systematic errors not evaluated.
[7] From analysis of L3 data at 91 and 183–209 GeV.
[8] From an analysis ignoring interference with $f_0(1710)$.




$f'_2(1525)$ width, $e^+ e^-$ annihilation and particle decays (MeV)

## PRODUCED IN $\overline{p}p$ ANNIHILATION

| *VALUE* (MeV) | *DOCUMENT ID* | | *TECN* | *COMMENT* |
|---|---|---|---|---|
| The data in this block is included in the average printed for a previous datablock. | | | | |
| **77 ± 5 OUR AVERAGE** | | | | |
| 76 ± 6 | AMSLER | 06 | CBAR | 0.9 $\overline{p}p \to K^+ K^- \pi^0$ |
| 79 ± 8 | [1] AMSLER | 02 | CBAR | 0.9 $\overline{p}p \to \pi^0 \eta\eta$, $\pi^0 \pi^0 \pi^0$ |
| • • • We do not use the following data for averages, fits, limits, etc. • • • | | | | |
| 104.8± 0.9±9.8 | [2] ALBRECHT | 20 | RVUE | 0.9 $\overline{p}p \to \pi^0 \pi^0 \eta$, $\pi^0 \eta\eta$, $\pi^0 K^+ K^-$ |
| 128 ±20 | [3] ANISOVICH | 09 | RVUE | 0.0 $\overline{p}p$, $\pi N$ |

[1] T-matrix pole.
[2] T-matrix pole, 4 poles, 4 channels, including scattering data from HYAMS 75 ($\pi\pi$), LONGACRE 86 ($K\overline{K}$), BINON 83 ($\eta\eta$).
[3] K-matrix, 4-poles, 5-channel fit.

## CENTRAL PRODUCTION

| *VALUE* (MeV) | *DOCUMENT ID* | | *TECN* | *COMMENT* |
|---|---|---|---|---|
| The data in this block is included in the average printed for a previous datablock. | | | | |
| **70±25** | BARBERIS | 99 | OMEG | 450 $pp \to p_s p_f K^+ K^-$ |

## PRODUCED IN $ep$ COLLISIONS

| *VALUE* (MeV) | *EVTS* | *DOCUMENT ID* | | *TECN* | *COMMENT* |
|---|---|---|---|---|---|
| The data in this block is included in the average printed for a previous datablock. | | | | | |
| **83± $9^{+5}_{-4}$** | | [1] CHEKANOV | 08 | ZEUS | $ep \to K^0_S K^0_S X$ |

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

| | | | | | |
|---|---|---|---|---|---|
| $50^{+34}_{-22}$ | 84 | [2] CHEKANOV | 04 | ZEUS | $e p \rightarrow K^0_S K^0_S X$ |

[1] 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.
[2] Systematic errors not estimated.

## $f'_2(1525)$ DECAY MODES

| | Mode | Fraction ($\Gamma_i/\Gamma$) | Scale factor |
|---|---|---|---|
| $\Gamma_1$ | $K\overline{K}$ | (87.6±2.2) % | 1.1 |
| $\Gamma_2$ | $\eta\eta$ | (11.6±2.2) % | 1.1 |
| $\Gamma_3$ | $\pi\pi$ | ( 8.3±1.6) × $10^{-3}$ | |
| $\Gamma_4$ | $K\overline{K}^*(892)$+ c.c. | | |
| $\Gamma_5$ | $\pi K\overline{K}$ | | |
| $\Gamma_6$ | $\pi\pi\eta$ | | |
| $\Gamma_7$ | $\pi^+\pi^+\pi^-\pi^-$ | | |
| $\Gamma_8$ | $\gamma\gamma$ | ( 9.5±1.1) × $10^{-7}$ | 1.1 |

## CONSTRAINED FIT INFORMATION

An overall fit to the total width, 2 partial widths, a combination of partial widths obtained from integrated cross sections, and 3 branching ratios uses 17 measurements and one constraint to determine 5 parameters. The overall fit has a $\chi^2 = 18.2$ for 13 degrees of freedom.

The following *off-diagonal* array elements are the correlation coefficients $\left\langle\delta p_i \delta p_j\right\rangle/(\delta p_i \cdot \delta p_j)$, in percent, from the fit to parameters $p_i$, including the branching fractions, $x_i \equiv \Gamma_i/\Gamma_{\text{total}}$. The fit constrains the $x_i$ whose labels appear in this array to sum to one.

| | | | | |
|---|---|---|---|---|
| $x_2$ | −100 | | | |
| $x_3$ | −6 | −1 | | |
| $x_8$ | −19 | 19 | 1 | |
| $\Gamma$ | −4 | 4 | 0 | −44 |
| | $x_1$ | $x_2$ | $x_3$ | $x_8$ |

| | Mode | Rate (MeV) | Scale factor |
|---|---|---|---|
| $\Gamma_1$ | $K\overline{K}$ | 75 ±4 | 1.8 |
| $\Gamma_2$ | $\eta\eta$ | 9.9 ±1.9 | 1.1 |
| $\Gamma_3$ | $\pi\pi$ | 0.71±0.14 | 1.1 |
| $\Gamma_8$ | $\gamma\gamma$ | ( 8.2 ±0.9 ) × $10^{-5}$ | |

# $f_2'(1525)$ PARTIAL WIDTHS

## $\Gamma(K\overline{K})$ — $\Gamma_1$

| VALUE (MeV) | DOCUMENT ID | TECN | COMMENT |
|---|---|---|---|
| **75±4 OUR FIT** Error includes scale factor of 1.8. | | | |
| **$63^{+6}_{-5}$** | [1] LONGACRE 86 | MPS | $22\ \pi^- p \to K^0_S K^0_S n$ |

[1] From a partial-wave analysis of data using a K-matrix formalism with 5 poles.

## $\Gamma(\eta\eta)$ — $\Gamma_2$

| VALUE (MeV) | EVTS | DOCUMENT ID | TECN | COMMENT |
|---|---|---|---|---|
| **9.9±1.9 OUR FIT** Error includes scale factor of 1.1. | | | | |
| • • • We do not use the following data for averages, fits, limits, etc. • • • | | | | |
| $5.0\pm0.8$ | 870 | [1] SCHEGELSKY 06A | RVUE | $\gamma\gamma \to K^0_S K^0_S$ |
| $24\ {}^{+3}_{-1}$ | | [2] LONGACRE 86 | MPS | $22\ \pi^- p \to K^0_S K^0_S n$ |

[1] From analysis of L3 data at 91 and 183–209 GeV, using $\Gamma(f_2'(1525) \to K\overline{K}) = 68$ MeV and SU(3) relations.
[2] From a partial-wave analysis of data using a K-matrix formalism with 5 poles.

## $\Gamma(\pi\pi)$ — $\Gamma_3$

| VALUE (MeV) | EVTS | DOCUMENT ID | TECN | COMMENT |
|---|---|---|---|---|
| **0.71±0.14 OUR FIT** Error includes scale factor of 1.1. | | | | |
| **$1.4\ {}^{+1.0}_{-0.5}$** | | [1] LONGACRE 86 | MPS | $22\ \pi^- p \to K^0_S K^0_S n$ |
| • • • We do not use the following data for averages, fits, limits, etc. • • • | | | | |
| $0.2\ {}^{+1.0}_{-0.2}$ | 870 | [2] SCHEGELSKY 06A | RVUE | $\gamma\gamma \to K^0_S K^0_S$ |

[1] From a partial-wave analysis of data using a K-matrix formalism with 5 poles.
[2] From analysis of L3 data at 91 and 183–209 GeV, using $\Gamma(f_2'(1525) \to K\overline{K}) = 68$ MeV and SU(3) relations.

## $\Gamma(\gamma\gamma)$ — $\Gamma_8$

| VALUE (keV) | EVTS | DOCUMENT ID | TECN | COMMENT |
|---|---|---|---|---|
| **0.082±0.009 OUR FIT** | | | | |
| • • • We do not use the following data for averages, fits, limits, etc. • • • | | | | |
| $0.13\ \pm0.03$ | 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 $\Gamma(f_2'(1525) \to K\overline{K}) = 68$ MeV and SU(3) relations.

## $\Gamma(K\overline{K})/\Gamma_{total}$ — $\Gamma_1/\Gamma$

| VALUE | DOCUMENT ID | TECN | COMMENT |
|---|---|---|---|
| • • • We do not use the following data for averages, fits, limits, etc. • • • | | | |
| $0.746\pm0.002^{+0.166}_{-0.162}$ | [1] ALBRECHT 20 | RVUE | $0.9\ \overline{p}p \to \pi^0\pi^0\eta$, $\pi^0\eta\eta$, $\pi^0 K^+ K^-$ |

[1] Residue from T-matrix pole, 4 poles, 4 channels, including scattering data from HYAMS 75 ($\pi\pi$), LONGACRE 86 ($K\overline{K}$), BINON 83 ($\eta\eta$).

## $f_2'(1525)$ Γ(i)Γ(γγ)/Γ(total)

### $\Gamma(K\overline{K}) \times \Gamma(\gamma\gamma)/\Gamma_{total}$ — $\Gamma_1\Gamma_8/\Gamma$

| VALUE (keV) | EVTS | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|---|
| **0.072 ±0.007 OUR FIT** | | | | | |
| **0.072 ±0.007 OUR AVERAGE** | | | | | |
| $0.048\ ^{+0.067}_{-0.008}\ ^{+0.108}_{-0.012}$ | | UEHARA | 13 | BELL | $\gamma\gamma \to K^0_S K^0_S$ |
| 0.0564±0.0048±0.0116 | | ABE | 04 | BELL | 10.6 $e^+e^- \to e^+e^- K^+K^-$ |
| 0.076 ±0.006 ±0.011 | 331 | [1] ACCIARRI | 01H | L3 | $e^+e^- \to e^+e^- K^0_S K^0_S$ |
| 0.067 ±0.008 ±0.015 | | [2] ALBRECHT | 90G | ARG | $e^+e^- \to e^+e^- K^+K^-$ |
| $0.11\ ^{+0.03}_{-0.02}\ \pm0.02$ | | BEHREND | 89C | CELL | $e^+e^- \to e^+e^- K^0_S K^0_S$ |
| $0.10\ ^{+0.04}_{-0.03}\ ^{+0.03}_{-0.02}$ | | BERGER | 88 | PLUT | $e^+e^- \to e^+e^- K^0_S K^0_S$ |
| 0.12 ±0.07 ±0.04 | | [2] AIHARA | 86B | TPC | $e^+e^- \to e^+e^- K^+K^-$ |
| 0.11 ±0.02 ±0.04 | | [2] ALTHOFF | 83 | TASS | $e^+e^- \to e^+e^- K\overline{K}$ |
| • • • We do not use the following data for averages, fits, limits, etc. • • • | | | | | |
| 0.0314±0.0050±0.0077 | | [3] ALBRECHT | 90G | ARG | $e^+e^- \to e^+e^- K^+K^-$ |

[1] Supersedes ACCIARRI 95J. From analysis of L3 data at 91 and 183–209 GeV,
[2] Using an incoherent background.
[3] Using a coherent background.

## $f_2'(1525)$ BRANCHING RATIOS

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

| VALUE | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|
| • • • We do not use the following data for averages, fits, limits, etc. • • • | | | | |
| 0.059±0.003±0.026 | [1] ALBRECHT | 20 | RVUE | 0.9 $\overline{p}p \to \pi^0\pi^0\eta$, $\pi^0\eta\eta$, $\pi^0 K^+K^-$ |
| seen | UEHARA | 10A | BELL | 10.6 $e^+e^- \to e^+e^-\eta\eta$ |
| 0.10 ±0.03 | [2] PROKOSHKIN | 91 | GAM4 | 300 $\pi^- p \to \pi^- p\eta\eta$ |

[1] Residue from T-matrix pole, 4 poles, 4 channels, including scattering data from HYAMS 75 ($\pi\pi$), LONGACRE 86 ($K\overline{K}$), BINON 83 ($\eta\eta$).
[2] Combining results of GAM4 with those of WA76 on $K\overline{K}$ central production and results of CBAL, MRK3 and DM2 on $J/\psi \to \gamma\eta\eta$.

### $\Gamma(\eta\eta)/\Gamma(K\overline{K})$ — $\Gamma_2/\Gamma_1$

| VALUE | CL% | EVTS | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|---|---|
| **0.132±0.028 OUR FIT** | | | | | | |
| **0.115±0.028 OUR AVERAGE** | | | | | | |
| 0.119±0.015±0.036 | | 61 | [1] BINON | 07 | GAMS | 32.5 $K^- p \to \eta\eta(\Lambda/\Sigma^0)$ |
| 0.11 ±0.04 | | | [2] PROKOSHKIN | 91 | GAM4 | 300 $\pi^- p \to \pi^- p\eta\eta$ |
| • • • We do not use the following data for averages, fits, limits, etc. • • • | | | | | | |
| $<0.14$ | 90 | | BARBERIS | 00E | | 450 $pp \to p_f\eta\eta p_s$ |
| $<0.50$ | | | BARNES | 67 | HBC | 4.6,5.0 $K^- p$ |

[1] Using the compilation of the cross sections for $f_2'(1525)$ production in $K^- p$ collisions from ASTON 88D.
[2] Combining results of GAM4 with those of WA76 on $K\overline{K}$ central production and results of CBAL, MRK3 and DM2 on $J/\psi \to \gamma\eta\eta$.

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

| VALUE (units $10^{-2}$) | CL% | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|---|
| **0.83±0.16 OUR FIT** | | | | | |
| **0.75±0.16 OUR AVERAGE** | | | | | |
| 0.7 ±0.2 | | COSTA | 80 | OMEG | 10 $\pi^- p \to K^+ K^- n$ |
| 2.7 $^{+7.1}_{-1.3}$ | | [1] GORLICH | 80 | ASPK | 17,18 $\pi^- p$ |
| 0.75±0.25 | | [1,2] MARTIN | 79 | RVUE | |
| • • • We do not use the following data for averages, fits, limits, etc. • • • | | | | | |
| 3.4 ±1.5 ±1.0 | | [3] ALBRECHT | 20 | RVUE | 0.9 $\overline{p}p \to \pi^0\pi^0\eta$, $\pi^0\eta\eta$, $\pi^0 K^+ K^-$ |
| < 6 | 95 | AGUILAR-... | 81B | HBC | 4.2 $K^- p \to \Lambda K^+ K^-$ |
| 19 ±3 | | CORDEN | 79 | OMEG | 12–15 $\pi^- p \to \pi^+\pi^- n$ |
| < 4.5 | 95 | BARREIRO | 77 | HBC | 4.15 $K^- p \to \Lambda K^0_S K^0_S$ |
| 1.2 ±0.4 | | [1] PAWLICKI | 77 | SPEC | 6 $\pi N \to K^+ K^- N$ |
| < 6.3 | 90 | BRANDENB... | 76C | ASPK | 13 $K^- p \to K^+ K^- (\Lambda, \Sigma)$ |
| < 0.86 | | [1] BEUSCH | 75B | OSPK | 8.9 $\pi^- p \to K^0 \overline{K}^0 n$ |

[1] Assuming that the $f'_2(1525)$ is produced by an one-pion exchange production mechanism.

[2] MARTIN 79 uses the PAWLICKI 77 data with different input value of the $f'_2(1525) \to K\overline{K}$ branching ratio.

[3] Residue from T-matrix pole, 4 poles, 4 channels, including scattering data from HYAMS 75 ($\pi\pi$), LONGACRE 86 ($K\overline{K}$), BINON 83 ($\eta\eta$).

## $\Gamma(\pi\pi)/\Gamma(K\overline{K})$ — $\Gamma_3/\Gamma_1$

| VALUE | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|
| **0.0094±0.0018 OUR FIT** | | | | |
| **0.075 ±0.035** | AUGUSTIN | 87 | DM2 | $J/\psi \to \gamma\pi^+\pi^-$ |

## $[\Gamma(K\overline{K}^*(892)+c.c.)+\Gamma(\pi K\overline{K})]/\Gamma(K\overline{K})$ — $(\Gamma_4+\Gamma_5)/\Gamma_1$

| VALUE | CL% | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|---|
| • • • We do not use the following data for averages, fits, limits, etc. • • • | | | | | |
| <0.35 | 95 | AGUILAR-... | 72B | HBC | 3.9,4.6 $K^- p$ |
| <0.4 | 67 | AMMAR | 67 | HBC | |

## $\Gamma(\pi\pi\eta)/\Gamma(K\overline{K})$ — $\Gamma_6/\Gamma_1$

| VALUE | CL% | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|---|
| • • • We do not use the following data for averages, fits, limits, etc. • • • | | | | | |
| <0.41 | 95 | AGUILAR-... | 72B | HBC | 3.9,4.6 $K^- p$ |
| <0.3 | 67 | AMMAR | 67 | HBC | |

## $\Gamma(\pi^+\pi^+\pi^-\pi^-)/\Gamma(K\overline{K})$ — $\Gamma_7/\Gamma_1$

| VALUE | CL% | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|---|
| • • • We do not use the following data for averages, fits, limits, etc. • • • | | | | | |
| <0.32 | 95 | AGUILAR-... | 72B | HBC | 3.9,4.6 $K^- p$ |

# $f_2'(1525)$ REFERENCES


| | | | | |
|---|---|---|---|---|
| KLEMPT | 22 | PL B830 137171 | E. Klempt *et al.* | (BONN) |
| RODAS | 22 | EPJ C82 80 | A. Rodas *et al.* | (JPAC Collab.) |
| ALBRECHT | 20 | EPJ C80 453 | M. Albrecht *et al.* | (Crystal Barrel Collab.) |
| ABLIKIM | 18AA | PR D98 072003 | M. Ablikim *et al.* | (BESIII Collab.) |
| PDG | 18 | PR D98 030001 | M. Tanabashi *et al.* | (PDG Collab.) |
| ABLIKIM | 15AE | PR D92 052003 | M. Ablikim *et al.* | (BESIII Collab.) |
| DOBBS | 15 | PR D91 052006 | S. Dobbs *et al.* | (NWES) |
| LEES | 14H | PR D89 092002 | J.P. Lees *et al.* | (BABAR Collab.) |
| AAIJ | 13AN | PR D87 072004 | R. Aaij *et al.* | (LHCb Collab.) |
| ABLIKIM | 13N | PR D87 092009 | M. Ablikim *et al.* | (BESIII Collab.) |
| UEHARA | 13 | PTEP 2013 123C01 | S. Uehara *et al.* | (BELLE Collab.) |
| UEHARA | 10A | PR D82 114031 | S. Uehara *et al.* | (BELLE Collab.) |
| ANISOVICH | 09 | IJMP A24 2481 | V.V. Anisovich, A.V. Sarantsev | (PNPI) |
| CHEKANOV | 08 | PRL 101 112003 | S. Chekanov *et al.* | (ZEUS Collab.) |
| BINON | 07 | PAN 70 1713 | F. Binon *et al.* | (GAMS Collab.) |
| | | Translated from YAF 70 1758. | | |
| AMSLER | 06 | PL B639 165 | C. Amsler *et al.* | (Crystal Barrel Collab.) |
| SCHEGELSKY | 06A | EPJ A27 207 | V.A. Schegelsky *et al.* | |
| ABLIKIM | 05 | PL B607 243 | M. Ablikim *et al.* | (BES Collab.) |
| ABE | 04 | EPJ C32 323 | K. Abe *et al.* | (BELLE Collab.) |
| CHEKANOV | 04 | PL B578 33 | S. Chekanov *et al.* | (ZEUS Collab.) |
| 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.* | (Crystal Barrel Collab.) |
| ACCIARRI | 01H | PL B501 173 | M. Acciarri *et al.* | (L3 Collab.) |
| BARBERIS | 00E | PL B479 59 | D. Barberis *et al.* | (WA 102 Collab.) |
| BARBERIS | 99 | PL B453 305 | D. Barberis *et al.* | (Omega Expt.) |
| BARKOV | 99 | JETPL 70 248 | B.P. Barkov *et al.* | |
| | | Translated from ZETFP 70 242. | | |
| ABREU | 96C | PL B379 309 | P. Abreu *et al.* | (DELPHI Collab.) |
| BAI | 96C | PRL 77 3959 | J.Z. Bai *et al.* | (BES Collab.) |
| ACCIARRI | 95J | PL B363 118 | M. Acciarri *et al.* | (L3 Collab.) |
| 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.) |
| BEHREND | 89C | ZPHY C43 91 | H.J. Behrend *et al.* | (CELLO Collab.) |
| ASTON | 88D | NP B301 525 | D. Aston *et al.* | (SLAC, NAGO, CINC, INUS) |
| AUGUSTIN | 88 | PRL 60 2238 | J.E. Augustin *et al.* | (DM2 Collab.) |
| BERGER | 88 | ZPHY C37 329 | C. Berger *et al.* | (PLUTO Collab.) |
| 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.) |
| AIHARA | 86B | PRL 57 404 | H. Aihara *et al.* | (TPC-2$\gamma$ Collab.) |
| BOLONKIN | 86 | SJNP 43 776 | B.V. Bolonkin *et al.* | (ITEP) JP |
| | | Translated from YAF 43 1211. | | |
| LONGACRE | 86 | PL B177 223 | R.S. Longacre *et al.* | (BNL, BRAN, CUNY+) |
| ALTHOFF | 83 | PL 121B 216 | M. Althoff *et al.* | (TASSO Collab.) |
| ARMSTRONG | 83B | NP B224 193 | T.A. Armstrong *et al.* | (BARI, BIRM, CERN+) |
| BINON | 83 | NC 78A 313 | F.G. Binon *et al.* | (BELG, LAPP, SERP+) |
| AGUILAR-... | 81B | ZPHY C8 313 | M. Aguilar-Benitez *et al.* | (CERN, CDEF+) |
| ALHARRAN | 81 | NP B191 26 | S. Al-Harran *et al.* | (BIRM, CERN, GLAS+) |
| CHABAUD | 81 | APP B12 575 | V. Chabaud *et al.* | (CERN, CRAC, MPIM) |
| COSTA | 80 | NP B175 402 | G. Costa *et al.* | (BARI, BONN, CERN, GLAS+) |
| GORLICH | 80 | NP B174 16 | L. Gorlich *et al.* | (CRAC, MPIM, CERN+) |
| CORDEN | 79 | NP B157 250 | M.J. Corden *et al.* | (BIRM, RHEL, TELA+) JP |
| MARTIN | 79 | NP B158 520 | A.D. Martin, E.N. Ozmutlu | (DURH) |
| POLYCHRO... | 79 | PR D19 1317 | V.A. Polychronakos *et al.* | (NDAM, ANL) |
| BARREIRO | 77 | NP B121 237 | F. Barreiro *et al.* | (CERN, AMST, NIJM+) |
| EVANGELIS... | 77 | NP B127 384 | C. Evangelista *et al.* | (BARI, BONN, CERN+) |
| PAWLICKI | 77 | PR D15 3196 | A.J. Pawlicki *et al.* | (ANL) IJP |
| BRANDENB... | 76C | NP B104 413 | G.W. Brandenburg *et al.* | (SLAC) |
| BEUSCH | 75B | PL 60B 101 | W. Beusch *et al.* | (CERN, ETH) |
| HYAMS | 75 | NP B100 205 | B.D. Hyams *et al.* | (CERN, MPIM) |
| AGUILAR-... | 72B | PR D6 29 | M. Aguilar-Benitez *et al.* | (BNL) |
| AMMAR | 67 | PRL 19 1071 | R. Ammar *et al.* | (NWES, ANL) JP |
| BARNES | 67 | PRL 19 964 | V.E. Barnes *et al.* | (BNL, SYRA) IJPC |
| CRENNELL | 66 | PRL 16 1025 | D.J. Crennell *et al.* | (BNL) I |