

$f_2(1270)$

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

 $f_2(1270)$ MASS

| VALUE (MeV) | EVTS | DOCUMENT ID | TECN | COMMENT |
|---|--------------------|----------------------------|------|---|
| 1275.4 ± 1.2 | OUR AVERAGE | | | |
| 1283 ± 5 | | ALDE 98 | GAM4 | 100 $\pi^- p \rightarrow \pi^0 \pi^0 n$ |
| 1278 ± 5 | | ¹ BERTIN 97C | OBLX | 0.0 $\bar{p} p \rightarrow \pi^+ \pi^- \pi^0$ |
| 1272 ± 8 | 200k | PROKOSHKIN 94 | GAM2 | 38 $\pi^- p \rightarrow \pi^0 \pi^0 n$ |
| 1269.7 ± 5.2 | 5730 | AUGUSTIN 89 | DM2 | $e^+ e^- \rightarrow 5\pi$ |
| 1283 ± 8 | 400 | ² ALDE 87 | GAM4 | 100 $\pi^- p \rightarrow 4\pi^0 n$ |
| 1274 ± 5 | | ² AUGUSTIN 87 | DM2 | $J/\psi \rightarrow \gamma \pi^+ \pi^-$ |
| 1283 ± 6 | | ³ LONGACRE 86 | MPS | 22 $\pi^- p \rightarrow n 2K_S^0$ |
| 1276 ± 7 | | COURAU 84 | DLCO | $e^+ e^- \rightarrow e^+ e^- \pi^+ \pi^-$ |
| 1273.3 ± 2.3 | | ⁴ CHABAUD 83 | ASPK | 17 $\pi^- p$ polarized |
| 1280 ± 4 | | ⁵ CASON 82 | STRC | 8 $\pi^+ p \rightarrow \Delta^{++} \pi^0 \pi^0$ |
| 1281 ± 7 | 11600 | GIDAL 81 | MRK2 | J/ψ decay |
| 1282 ± 5 | | ⁶ CORDEN 79 | OMEG | 12–15 $\pi^- p \rightarrow n 2\pi$ |
| 1269 ± 4 | 10k | APEL 75 | NICE | 40 $\pi^- p \rightarrow n 2\pi^0$ |
| 1272 ± 4 | 4600 | ENGLER 74 | DBC | 6 $\pi^+ n \rightarrow \pi^+ \pi^- p$ |
| 1277 ± 4 | 5300 | FLATTE 71 | HBC | 7.0 $\pi^+ p$ |
| 1273 ± 8 | | ² STUNTEBECK 70 | HBC | 8 $\pi^- p$, 5.4 $\pi^+ d$ |
| 1265 ± 8 | | BOESEBECK 68 | HBC | 8 $\pi^+ p$ |
| ● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ● | | | | |
| 1260 ± 10 | | ⁷ ALDE 97 | GAM2 | 450 $pp \rightarrow pp \pi^0 \pi^0$ |
| 1278 ± 6 | | ⁷ GRYGOREV 96 | SPEC | 40 $\pi^- N \rightarrow K_S^0 K_S^0 X$ |
| 1262 ± 11 | | AGUILAR-... 91 | EHS | 400 pp |
| 1275 ± 10 | | AKER 91 | CBAR | 0.0 $\bar{p} p \rightarrow 3\pi^0$ |
| 1220 ± 10 | | BREAKSTONE 90 | SFM | $pp \rightarrow pp \pi^+ \pi^-$ |
| 1288 ± 12 | | ABACHI 86B | HRS | $e^+ e^- \rightarrow \pi^+ \pi^- X$ |
| 1284 ± 30 | 3k | BINON 83 | GAM2 | 38 $\pi^- p \rightarrow n 2\eta$ |
| 1280 ± 20 | 3k | APEL 82 | CNTR | 25 $\pi^- p \rightarrow n 2\pi^0$ |
| 1284 ± 10 | 16000 | DEUTSCH... 76 | HBC | 16 $\pi^+ p$ |
| 1258 ± 10 | 600 | TAKAHASHI 72 | HBC | 8 $\pi^- p \rightarrow n 2\pi$ |
| 1275 ± 13 | | ARMENISE 70 | HBC | 9 $\pi^+ n \rightarrow p \pi^+ \pi^-$ |
| 1261 ± 5 | 1960 | ² ARMENISE 68 | DBC | 5.1 $\pi^+ n \rightarrow p \pi^+ \text{MM}^-$ |
| 1270 ± 10 | 360 | ² ARMENISE 68 | DBC | 5.1 $\pi^+ n \rightarrow p \pi^0 \text{MM}$ |
| 1268 ± 6 | | ⁸ JOHNSON 68 | HBC | 3.7–4.2 $\pi^- p$ |

¹ T-matrix pole.² Mass errors enlarged by us to Γ/\sqrt{N} ; see the note with the $K^*(892)$ mass.³ From a partial-wave analysis of data using a K-matrix formalism with 5 poles.⁴ From an energy-independent partial-wave analysis.⁵ From an amplitude analysis of the reaction $\pi^+ \pi^- \rightarrow 2\pi^0$.⁶ From an amplitude analysis of $\pi^+ \pi^- \rightarrow \pi^+ \pi^-$ scattering data.⁷ Systematic uncertainties not estimated.⁸ JOHNSON 68 includes BONDAR 63, LEE 64, DERADO 65, EISNER 67.

$f_2(1270)$ WIDTH

| VALUE (MeV) | EVTS | DOCUMENT ID | TECN | COMMENT |
|---|-------|--|------|--|
| 185.1^{+3.5}_{-2.6} | | OUR NEW UNCHECKED FIT Error includes scale factor of 1.5. | | |
| [185.1 ^{+3.4} _{-2.6} | | MeV OUR 2002 FIT Scale factor = 1.5] | | |
| 184.3^{+4.0}_{-2.6} | | OUR AVERAGE Error includes scale factor of 1.6. See the ideogram below. | | |
| 171 ± 10 | | ALDE | 98 | GAM4 100 $\pi^- p \rightarrow \pi^0 \pi^0 n$ |
| 204 ± 20 | | ⁹ BERTIN | 97C | OBLX 0.0 $\bar{p} p \rightarrow \pi^+ \pi^- \pi^0$ |
| 192 ± 5 | 200k | PROKOSHKIN | 94 | GAM2 38 $\pi^- p \rightarrow \pi^0 \pi^0 n$ |
| 180 ± 24 | | AGUILAR-... | 91 | EHS 400 pp |
| 169 ± 9 | 5730 | ¹⁰ AUGUSTIN | 89 | DM2 $e^+ e^- \rightarrow 5\pi$ |
| 150 ± 30 | 400 | ¹⁰ ALDE | 87 | GAM4 100 $\pi^- p \rightarrow 4\pi^0 n$ |
| 186 ⁺⁹ ₋₂ | | ¹¹ LONGACRE | 86 | MPS 22 $\pi^- p \rightarrow n2K_S^0$ |
| 179.2 ^{+6.9} _{-6.6} | | ¹² CHABAUD | 83 | ASPK 17 $\pi^- p$ polarized |
| 160 ± 11 | | DENNEY | 83 | LASS 10 $\pi^+ N$ |
| 196 ± 10 | 3k | APEL | 82 | CNTR 25 $\pi^- p \rightarrow n2\pi^0$ |
| 152 ± 9 | | ¹³ CASON | 82 | STRC 8 $\pi^+ p \rightarrow \Delta^{++} \pi^0 \pi^0$ |
| 186 ± 27 | 11600 | GIDAL | 81 | MRK2 J/ψ decay |
| 216 ± 13 | | ¹⁴ CORDEN | 79 | OMEG 12-15 $\pi^- p \rightarrow n2\pi$ |
| 190 ± 10 | 10k | APEL | 75 | NICE 40 $\pi^- p \rightarrow n2\pi^0$ |
| 192 ± 16 | 4600 | ENGLER | 74 | DBC 6 $\pi^+ n \rightarrow \pi^+ \pi^- p$ |
| 183 ± 15 | 5300 | FLATTE | 71 | HBC 7 $\pi^+ p \rightarrow \Delta^{++} f_2$ |
| 196 ± 30 | | ¹⁰ STUNTEBECK | 70 | HBC 8 $\pi^- p$, 5.4 $\pi^+ d$ |
| 216 ± 20 | 1960 | ¹⁰ ARMENISE | 68 | DBC 5.1 $\pi^+ n \rightarrow p\pi^+ MM^-$ |
| 128 ± 27 | | ¹⁰ BOESEBECK | 68 | HBC 8 $\pi^+ p$ |
| 176 ± 21 | | ^{10,15} JOHNSON | 68 | HBC 3.7-4.2 $\pi^- p$ |
| ● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ● | | | | |
| 187 ± 20 | | ¹⁶ ALDE | 97 | GAM2 450 $pp \rightarrow pp\pi^0 \pi^0$ |
| 184 ± 10 | | ¹⁶ GRYGOREV | 96 | SPEC 40 $\pi^- N \rightarrow K_S^0 K_S^0 X$ |
| 200 ± 10 | | AKER | 91 | CBAR 0.0 $\bar{p} p \rightarrow 3\pi^0$ |
| 240 ± 40 | 3k | BINON | 83 | GAM2 38 $\pi^- p \rightarrow n2\eta$ |
| 187 ± 30 | 650 | ¹⁰ ANTIPOV | 77 | CIBS 25 $\pi^- p \rightarrow p3\pi$ |
| 225 ± 38 | 16000 | DEUTSCH... | 76 | HBC 16 $\pi^+ p$ |
| 166 ± 28 | 600 | ¹⁰ TAKAHASHI | 72 | HBC 8 $\pi^- p \rightarrow n2\pi$ |
| 173 ± 53 | | ¹⁰ ARMENISE | 70 | HBC 9 $\pi^+ n \rightarrow p\pi^+ \pi^-$ |

⁹T-matrix pole.

¹⁰Width errors enlarged by us to $4\Gamma/\sqrt{N}$; see the note with the $K^*(892)$ mass.

¹¹From a partial-wave analysis of data using a K-matrix formalism with 5 poles.

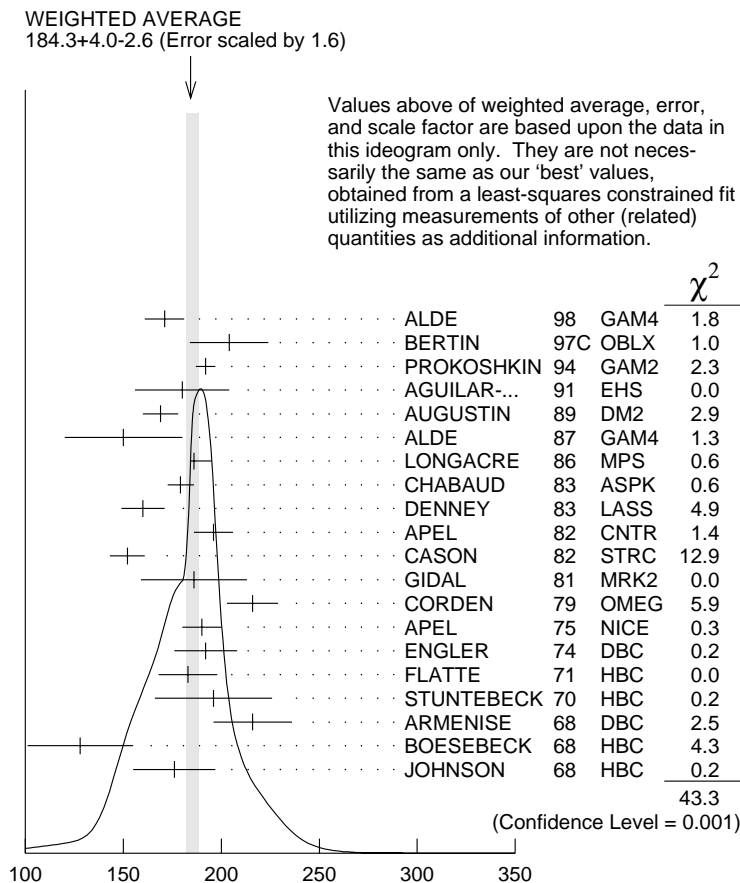
¹²From an energy-independent partial-wave analysis.

¹³From an amplitude analysis of the reaction $\pi^+ \pi^- \rightarrow 2\pi^0$.

¹⁴From an amplitude analysis of $\pi^+ \pi^- \rightarrow \pi^+ \pi^-$ scattering data.

¹⁵JOHNSON 68 includes BONDAR 63, LEE 64, DERADO 65, EISNER 67.

¹⁶Systematic uncertainties not estimated.



$f_2(1270)$ width (MeV)

$f_2(1270)$ DECAY MODES

| Mode | Fraction (Γ_i/Γ) | Scale factor/ Confidence level |
|-------------------------------|------------------------------------|-----------------------------------|
| Γ_1 $\pi\pi$ | (84.8 $^{+2.5}_{-1.3}$) % | S=1.3 |
| Γ_2 $\pi^+\pi^-2\pi^0$ | (7.1 $^{+1.5}_{-2.7}$) % | S=1.3 |
| Γ_3 $K\bar{K}$ | (4.6 ± 0.4) % | S=2.7 |
| Γ_4 $2\pi^+2\pi^-$ | (2.8 ± 0.4) % | S=1.2 |
| Γ_5 $\eta\eta$ | (4.5 ± 1.0) $\times 10^{-3}$ | S=2.4 |
| Γ_6 $4\pi^0$ | (3.0 ± 1.0) $\times 10^{-3}$ | |

| | | | |
|---------------|-------------------------------|----------------------------------|--------|
| Γ_7 | $\gamma\gamma$ | $(1.41 \pm 0.13) \times 10^{-5}$ | |
| Γ_8 | $\eta\pi\pi$ | $< 8 \times 10^{-3}$ | CL=95% |
| Γ_9 | $K^0 K^- \pi^+ + \text{c.c.}$ | $< 3.4 \times 10^{-3}$ | CL=95% |
| Γ_{10} | $e^+ e^-$ | $< 6 \times 10^{-10}$ | CL=90% |

CONSTRAINED FIT INFORMATION

An overall fit to the total width, 4 partial widths, a combination of partial widths obtained from integrated cross sections, and 6 branching ratios uses 42 measurements and one constraint to determine 8 parameters. The overall fit has a $\chi^2 = 74.4$ for 35 degrees of freedom.

The following *off-diagonal* array elements are the correlation coefficients $\langle \delta p_i \delta p_j \rangle / (\delta p_i \cdot \delta p_j)$, 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 | -92 | | | | | | |
| x_3 | 12 | -38 | | | | | |
| x_4 | 11 | -37 | 1 | | | | |
| x_5 | 2 | -9 | 0 | 0 | | | |
| x_6 | 0 | -7 | 0 | 0 | 0 | | |
| x_7 | 11 | -8 | -8 | 1 | 0 | 0 | |
| Γ | -79 | 73 | -12 | -8 | -3 | 0 | -15 |
| | x_1 | x_2 | x_3 | x_4 | x_5 | x_6 | x_7 |

| Mode | | Rate (MeV) | | Scale factor |
|------------|----------------------|-----------------------|------------------|--------------|
| Γ_1 | $\pi\pi$ | 156.9 | $+4.0$ -1.2 | |
| Γ_2 | $\pi^+ \pi^- 2\pi^0$ | 13.1 | $+2.9$ -5.1 | 1.3 |
| Γ_3 | $K\bar{K}$ | 8.5 | ± 0.8 | 2.7 |
| Γ_4 | $2\pi^+ 2\pi^-$ | 5.2 | ± 0.7 | 1.2 |
| Γ_5 | $\eta\eta$ | 0.83 | ± 0.18 | 2.4 |
| Γ_6 | $4\pi^0$ | 0.55 | ± 0.19 | |
| Γ_7 | $\gamma\gamma$ | 0.00260 \pm 0.00024 | | |

$f_2(1270)$ PARTIAL WIDTHS

| | | | | | | |
|-----------------------|------------------------------|-------------------------|---------|-----------------------------------|--|------------|
| $\Gamma(\pi\pi)$ | | | | | | Γ_1 |
| VALUE (MeV) | DOCUMENT ID | TECN | COMMENT | | | |
| $156.9^{+4.0}_{-1.2}$ | OUR NEW UNCHECKED FIT | $[156.9^{+3.8}_{-1.3}]$ | MeV | OUR 2002 FIT] | | |
| $157.0^{+6.0}_{-1.0}$ | ¹⁸ LONGACRE | 86 | MPS | $22 \pi^- p \rightarrow n 2K_S^0$ | | |

$\Gamma(K\bar{K})$

Γ_3

| VALUE (MeV) | DOCUMENT ID | TECN | COMMENT |
|---|-------------|------|--|
| 8.5 ± 0.8 OUR NEW UNCHECKED FIT | | | Error includes scale factor of 2.7. [8.6 ± 0.8 MeV OUR 2002 FIT Scale factor = 2.9] |

| | | | |
|---------------------------------------|------------------------|----|---------------------------------------|
| $9.0^{+0.7}_{-0.3}$ | ¹⁸ LONGACRE | 86 | MPS 22 $\pi^- p \rightarrow n 2K_S^0$ |
|---------------------------------------|------------------------|----|---------------------------------------|

$\Gamma(\eta\eta)$

Γ_5

| VALUE (MeV) | DOCUMENT ID | TECN | COMMENT |
|---|-------------|------|-------------------------------------|
| 0.83 ± 0.18 OUR FIT | | | Error includes scale factor of 2.4. |

| | | | |
|---------------------------------|------------------------|----|---------------------------------------|
| 1.0 ± 0.1 | ¹⁸ LONGACRE | 86 | MPS 22 $\pi^- p \rightarrow n 2K_S^0$ |
|---------------------------------|------------------------|----|---------------------------------------|

$\Gamma(\gamma\gamma)$

Γ_7

The value of this width depends on the theoretical model used. Unitarised models with scalars give values clustering around $\simeq 2.6$ keV; without an S-wave contribution, values are systematically higher (typically around 3 keV).

| VALUE (keV) | EVTS | DOCUMENT ID | TECN | COMMENT |
|---|------|-------------|------|---------|
| 2.60 ± 0.24 OUR FIT | | | | |

$2.71^{+0.26}_{-0.23}$ OUR AVERAGE

| | | | | |
|---|------|-----------------------|-----|--|
| 2.84 ± 0.35 | | BOGLIONE | 99 | RVUE $\gamma\gamma \rightarrow \pi^+ \pi^-, \pi^0 \pi^0$ |
| $2.58 \pm 0.13^{+0.36}_{-0.27}$ | | ¹⁹ BEHREND | 92 | CELL $e^+ e^- \rightarrow e^+ e^- \pi^+ \pi^-$ |
| ● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ● | | | | |
| $2.93 \pm 0.23 \pm 0.32$ | | ¹⁷ YABUKI | 95 | VNS |
| $3.10 \pm 0.35 \pm 0.35$ | | ²⁰ BLINOV | 92 | MD1 $e^+ e^- \rightarrow e^+ e^- \pi^+ \pi^-$ |
| $2.27 \pm 0.47 \pm 0.11$ | | ADACHI | 90D | TOPZ $e^+ e^- \rightarrow e^+ e^- \pi^+ \pi^-$ |
| $3.15 \pm 0.04 \pm 0.39$ | | BOYER | 90 | MRK2 $e^+ e^- \rightarrow e^+ e^- \pi^+ \pi^-$ |
| $3.19 \pm 0.16^{+0.29}_{-0.28}$ | | MARSISKE | 90 | CBAL $e^+ e^- \rightarrow e^+ e^- \pi^0 \pi^0$ |
| 2.35 ± 0.65 | | ²¹ MORGAN | 90 | RVUE $\gamma\gamma \rightarrow \pi^+ \pi^-, \pi^0 \pi^0$ |
| $3.19 \pm 0.09^{+0.22}_{-0.38}$ | 2177 | OEST | 90 | JADE $e^+ e^- \rightarrow e^+ e^- \pi^0 \pi^0$ |
| $3.2 \pm 0.1 \pm 0.4$ | | ²² AIHARA | 86B | TPC $e^+ e^- \rightarrow e^+ e^- \pi^+ \pi^-$ |
| $2.5 \pm 0.1 \pm 0.5$ | | BEHREND | 84B | CELL $e^+ e^- \rightarrow e^+ e^- \pi^+ \pi^-$ |
| $2.85 \pm 0.25 \pm 0.5$ | | ²³ BERGER | 84 | PLUT $e^+ e^- \rightarrow e^+ e^- 2\pi$ |
| $2.70 \pm 0.05 \pm 0.20$ | | COURAU | 84 | DLCO $e^+ e^- \rightarrow e^+ e^- \pi^+ \pi^-$ |
| $2.52 \pm 0.13 \pm 0.38$ | | ²⁴ SMITH | 84C | MRK2 $e^+ e^- \rightarrow e^+ e^- \pi^+ \pi^-$ |
| $2.7 \pm 0.2 \pm 0.6$ | | EDWARDS | 82F | CBAL $e^+ e^- \rightarrow e^+ e^- 2\pi^0$ |
| $2.9^{+0.6}_{-0.4} \pm 0.6$ | | ²⁵ EDWARDS | 82F | CBAL $e^+ e^- \rightarrow e^+ e^- 2\pi^0$ |
| $3.2 \pm 0.2 \pm 0.6$ | | BRANDELIK | 81B | TASS $e^+ e^- \rightarrow e^+ e^- \pi^+ \pi^-$ |
| $3.6 \pm 0.3 \pm 0.5$ | | ROUSSARIE | 81 | MRK2 $e^+ e^- \rightarrow e^+ e^- \pi^+ \pi^-$ |
| 2.3 ± 0.8 | | ²⁶ BERGER | 80B | PLUT $e^+ e^-$ |

¹⁷ With a narrow scalar state around 1220 MeV.

| $\Gamma(e^+e^-)$ | | | | | Γ_{10} |
|---|-----|-------------|---------|---------------------------------|---------------|
| VALUE (eV) | CL% | DOCUMENT ID | TECN | COMMENT | |
| <0.11 | 90 | ACHASOV | 00k SND | $e^+e^- \rightarrow \pi^0\pi^0$ | |
| • • • We do not use the following data for averages, fits, limits, etc. • • • | | | | | |
| <1.7 | 90 | VOROBYEV | 88 ND | $e^+e^- \rightarrow \pi^0\pi^0$ | |
| ¹⁸ From a partial-wave analysis of data using a K-matrix formalism with 5 poles. | | | | | |
| ¹⁹ Using a unitarized model with a 300 - 500 keV wide scalar at 1100 MeV. | | | | | |
| ²⁰ Using the unitarized model of LYTH 85. | | | | | |
| ²¹ Error includes spread of different solutions. Data of MARK2 and CRYSTAL BALL used in the analysis. Authors report strong correlations with $\gamma\gamma$ width of $f_0(1370)$: $\Gamma(f_2) + 1/4 \Gamma(f^0) = 3.6 \pm 0.3$ KeV. | | | | | |
| ²² Radiative corrections modify the partial widths; for instance the COURAU 84 value becomes 2.66 ± 0.21 in the calculation of LANDRO 86. | | | | | |
| ²³ Using the MENNESSIER 83 model. | | | | | |
| ²⁴ Superseded by BOYER 90. | | | | | |
| ²⁵ If helicity = 2 assumption is not made. | | | | | |
| ²⁶ Using mass, width and $B(f_2(1270) \rightarrow 2\pi)$ from PDG 78. | | | | | |

$f_2(1270) \Gamma(i)\Gamma(\gamma\gamma)/\Gamma(\text{total})$

| $\Gamma(K\bar{K}) \times \Gamma(\gamma\gamma)/\Gamma_{\text{total}}$ | | | | | $\Gamma_3\Gamma_7/\Gamma$ |
|---|--|------------------------------|---------|-------------------------------------|---|
| VALUE (keV) | | DOCUMENT ID | TECN | COMMENT | |
| 0.120 ± 0.014 | | OUR NEW UNCHECKED FIT | | | Error includes scale factor of 1.3. $[0.121 \pm 0.015$ keV OUR 2002 FIT Scale factor = 1.3] |
| $0.091 \pm 0.007 \pm 0.027$ | | ²⁷ ALBRECHT | 90G ARG | $e^+e^- \rightarrow e^+e^- K^+ K^-$ | |
| • • • We do not use the following data for averages, fits, limits, etc. • • • | | | | | |
| $0.104 \pm 0.007 \pm 0.072$ | | ²⁸ ALBRECHT | 90G ARG | $e^+e^- \rightarrow e^+e^- K^+ K^-$ | |
| ²⁷ Using an incoherent background. | | | | | |
| ²⁸ Using a coherent background. | | | | | |

$f_2(1270)$ BRANCHING RATIOS

| $\Gamma(\pi\pi)/\Gamma_{\text{total}}$ | | | | | Γ_1/Γ |
|---|------|------------------------------|---------|--|-------------------------------------|
| VALUE | EVTS | DOCUMENT ID | TECN | COMMENT | |
| $0.848^{+0.025}_{-0.013}$ | | OUR NEW UNCHECKED FIT | | | Error includes scale factor of 1.3. |
| $[0.847^{+0.024}_{-0.013}$ OUR 2002 FIT Scale factor = 1.3] | | | | | |
| 0.837 ± 0.020 OUR AVERAGE | | | | | |
| 0.849 ± 0.025 | | CHABAUD | 83 ASPK | 17 $\pi^- p$ polarized | |
| 0.85 ± 0.05 | 250 | BEAUPRE | 71 HBC | 8 $\pi^+ p \rightarrow \Delta^{++} f_2$ | |
| 0.8 ± 0.04 | 600 | OH | 70 HBC | 1.26 $\pi^- p \rightarrow \pi^+ \pi^- n$ | |

$\Gamma(\pi^+\pi^-\pi^0)/\Gamma(\pi\pi)$ Γ_2/Γ_1

Should be twice $\Gamma(2\pi^+2\pi^-)/\Gamma(\pi\pi)$ if decay is $\rho\rho$. (See ASCOLI 68D.)

| VALUE | EVTS | DOCUMENT ID | TECN | COMMENT |
|-------|------|-------------|------|---------|
|-------|------|-------------|------|---------|

0.083^{+0.019}_{-0.034} OUR NEW UNCHECKED FIT Error includes scale factor of 1.3.

[0.083^{+0.019}_{-0.033} OUR 2002 FIT Scale factor = 1.3]

| | | | | |
|-------------|-----|-----------|--------|---|
| 0.15 ± 0.06 | 600 | EISENBERG | 74 HBC | 4.9 $\pi^+ p \rightarrow \Delta^{++} f_2$ |
|-------------|-----|-----------|--------|---|

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

| | | | | |
|------|--|------|---------|-------------------------------|
| 0.07 | | EMMS | 75D DBC | 4 $\pi^+ n \rightarrow p f_2$ |
|------|--|------|---------|-------------------------------|

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

We average only experiments which either take into account $f_2(1270)$ - $a_2(1320)$ interference explicitly or demonstrate that $a_2(1320)$ production is negligible.

| VALUE | EVTS | DOCUMENT ID | TECN | COMMENT |
|-------|------|-------------|------|---------|
|-------|------|-------------|------|---------|

0.054^{+0.005}_{-0.006} OUR NEW UNCHECKED FIT Error includes scale factor of 2.7.

[0.055^{+0.005}_{-0.006} OUR 2002 FIT Scale factor = 2.8]

0.041^{+0.004}_{-0.005} OUR NEW AVERAGE [0.040^{+0.005}_{-0.006} OUR 2002 AVERAGE]

| | | | | |
|---|----|----------------|---------|---|
| 0.045 ± 0.01 | | 29 BARGIOTTI | 03 OBLX | $\bar{p}p$ |
| 0.037 ^{+0.008} _{-0.021} | | ETKIN | 82B MPS | 23 $\pi^- p \rightarrow n 2K_S^0$ |
| 0.045 ± 0.009 | | CHABAUD | 81 ASPK | 17 $\pi^- p$ polarized |
| 0.039 ± 0.008 | | LOVERRE | 80 HBC | 4 $\pi^- p \rightarrow K\bar{K}N$ |
| • • • We do not use the following data for averages, fits, limits, etc. • • • | | | | |
| 0.036 ± 0.005 | | 30 COSTA... | 80 OMEG | 1-2.2 $\pi^- p \rightarrow K^+ K^- n$ |
| 0.030 ± 0.005 | | 31 MARTIN | 79 RVUE | |
| 0.027 ± 0.009 | | 32 POLYCHRO... | 79 STRC | 7 $\pi^- p \rightarrow n 2K_S^0$ |
| 0.025 ± 0.015 | | EMMS | 75D DBC | 4 $\pi^+ n \rightarrow p f_2$ |
| 0.031 ± 0.012 | 20 | ADERHOLZ | 69 HBC | 8 $\pi^+ p \rightarrow K^+ K^- \pi^+ p$ |

$\Gamma(2\pi^+2\pi^-)/\Gamma(\pi\pi)$ Γ_4/Γ_1

| VALUE | EVTS | DOCUMENT ID | TECN | COMMENT |
|-------|------|-------------|------|---------|
|-------|------|-------------|------|---------|

0.033 ± 0.005 OUR FIT Error includes scale factor of 1.2.

0.033 ± 0.004 OUR AVERAGE Error includes scale factor of 1.1.

| | | | | |
|---|-----|-----------|---------|---|
| 0.024 ± 0.006 | 160 | EMMS | 75D DBC | 4 $\pi^+ n \rightarrow p f_2$ |
| 0.051 ± 0.025 | 70 | EISENBERG | 74 HBC | 4.9 $\pi^+ p \rightarrow \Delta^{++} f_2$ |
| 0.043 ^{+0.007} _{-0.011} | 285 | LOUIE | 74 HBC | 3.9 $\pi^- p \rightarrow n f_2$ |
| 0.037 ± 0.007 | 154 | ANDERSON | 73 DBC | 6 $\pi^+ n \rightarrow p f_2$ |
| 0.047 ± 0.013 | | OH | 70 HBC | 1.26 $\pi^- p \rightarrow \pi^+ \pi^- n$ |

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

| VALUE (units 10 ⁻³) | DOCUMENT ID | TECN | COMMENT |
|---------------------------------|-------------|------|---------|
|---------------------------------|-------------|------|---------|

4.5 ± 1.0 OUR FIT Error includes scale factor of 2.4.

3.1 ± 0.8 OUR AVERAGE Error includes scale factor of 1.3.

| | | | |
|-----------|-------|----------|-----------------------------------|
| 2.8 ± 0.7 | ALDE | 86D GAM4 | 100 $\pi^- p \rightarrow 2\eta n$ |
| 5.2 ± 1.7 | BINON | 83 GAM2 | 38 $\pi^- p \rightarrow 2\eta n$ |

$\Gamma(\eta\eta)/\Gamma(\pi\pi)$

Γ_5/Γ_1

| VALUE | CL% | DOCUMENT ID | TECN | COMMENT |
|---|-----|-------------|----------|---|
| 0.003 ± 0.001 | | BARBERIS | 00E | 450 $p p \rightarrow p_f \eta \eta p_S$ |
| ● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ● | | | | |
| <0.05 | 95 | EDWARDS | 82F CBAL | $e^+ e^- \rightarrow e^+ e^- 2\eta$ |
| <0.016 | 95 | EMMS | 75D DBC | $4 \pi^+ n \rightarrow p f_2$ |
| <0.09 | 95 | EISENBERG | 74 HBC | $4.9 \pi^+ p \rightarrow \Delta^{++} f_2$ |

$\Gamma(4\pi^0)/\Gamma_{\text{total}}$

Γ_6/Γ

| VALUE | EVTS | DOCUMENT ID | TECN | COMMENT |
|--------------------------------|----------|-------------|---------|------------------------------------|
| 0.0030 ± 0.0010 OUR FIT | | | | |
| 0.003 ± 0.001 | 400 ± 50 | ALDE | 87 GAM4 | 100 $\pi^- p \rightarrow 4\pi^0 n$ |

$\Gamma(\eta\pi\pi)/\Gamma(\pi\pi)$

Γ_8/Γ_1

| VALUE | CL% | DOCUMENT ID | TECN | COMMENT |
|------------------|-----|-------------|---------|-------------------------------|
| <0.010 | 95 | EMMS | 75D DBC | $4 \pi^+ n \rightarrow p f_2$ |

$\Gamma(K^0 K^- \pi^+ + \text{c.c.})/\Gamma(\pi\pi)$

Γ_9/Γ_1

| VALUE | CL% | DOCUMENT ID | TECN | COMMENT |
|------------------|-----|-------------|---------|-------------------------------|
| <0.004 | 95 | EMMS | 75D DBC | $4 \pi^+ n \rightarrow p f_2$ |

$\Gamma(e^+ e^-)/\Gamma_{\text{total}}$

Γ_{10}/Γ

| VALUE (units 10^{-10}) | CL% | DOCUMENT ID | TECN | COMMENT |
|---------------------------|-----|-------------|---------|-----------------------------------|
| <6 | 90 | ACHASOV | 00K SND | $e^+ e^- \rightarrow \pi^0 \pi^0$ |

²⁹ Coupled channel analysis of $\pi^+ \pi^- \pi^0$, $K^+ K^- \pi^0$, and $K^\pm K_S^0 \pi^\mp$.

³⁰ Re-evaluated by CHABAUD 83.

³¹ Includes PAWLICKI 77 data.

³² Takes into account the $f_2(1270)$ - $f_2'(1525)$ interference.

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