## $a_2(1320)$ WIDTH

### $3\pi$ MODE

| VALUE (MeV) | EVTS | DOCUMENT ID | | TECN | CHG | COMMENT |
|---|---|---|---|---|---|---|
| **103.4± 2.1 OUR AVERAGE** | | | | | | |
| 120 ±10 | | ARMSTRONG | 90 | OMEG | 0 | 300.0 $pp \rightarrow pp\pi^+\pi^-\pi^0$ |
| 107.0± 9.7 | 4022 | AUGUSTIN | 89 | DM2 | ± | $J/\psi \rightarrow \rho^{\pm} a_2^{\mp}$ |
| 118.5±12.5 | 3562 | AUGUSTIN | 89 | DM2 | 0 | $J/\psi \rightarrow \rho^0 a_2^0$ |
| 97 ± 5 | | [7] EVANGELISTA | 81 | OMEG | − | 12 $\pi^- p \rightarrow 3\pi p$ |
| 96.0± 9.0 | 25000 | [7] DAUM | 80C | SPEC | − | 63,94 $\pi^- p \rightarrow 3\pi p$ |
| 110.0±15.0 | 1097 | [7] BALTAY | 78B | HBC | +0 | 15 $\pi^+ p \rightarrow p4\pi$ |
| 112 ±18 | 1600 | [7] EMMS | 75 | DBC | 0 | 4 $\pi^+ n \rightarrow p(3\pi)^0$ |
| 122 ±14 | 1200 | [7,8] WAGNER | 75 | HBC | 0 | 7 $\pi^+ p \rightarrow \Delta^{++}(3\pi)^0$ |
| 115 ±15 | | [7] ANTIPOV | 73C | CNTR | − | 25,40 $\pi^- p \rightarrow p\eta\pi^-$ |
| 99 ±15 | 1580 | CHALOUPKA | 73 | HBC | − | 3.9 $\pi^- p$ |
| 105.0± 5.0 | 28000 | BOWEN | 71 | MMS | − | 5 $\pi^- p$ |
| 99.0± 5.0 | 24000 | BOWEN | 71 | MMS | + | 5 $\pi^+ p$ |
| 103.0± 5.0 | 17000 | BOWEN | 71 | MMS | − | 7 $\pi^- p$ |
| • • • We do not use the following data for averages, fits, limits, etc. • • • | | | | | | |
| 120 ±40 | | CONDO | 93 | SHF | | $\gamma p \rightarrow \eta\pi^+\pi^+\pi^-$ |
| 115.0±14.0 | 490 | BALTAY | 78B | HBC | 0 | 15 $\pi^+ p \rightarrow \Delta 3\pi$ |
| 72 ±16 | 5000 | BINNIE | 71 | MMS | − | $\pi^- p$ near $a_2$ threshold |
| 79.0±12.0 | 941 | ALSTON-... | 70 | HBC | + | 7.0 $\pi^+ p \rightarrow 3\pi p$ |

[7] From a fit to $J^P = 2^+$ $\rho\pi$ partial wave.

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

### $K^{\pm} K^0_S$ AND $\eta\pi$ MODES

| VALUE (MeV) | DOCUMENT ID |
|---|---|
| **107 ±5 OUR ESTIMATE** | |
| **110.1±1.9 OUR AVERAGE** | Includes data from the 2 datablocks that follow this one. |

### $K^{\pm} K^0_S$ MODE

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

| VALUE (MeV) | EVTS | DOCUMENT ID | | TECN | CHG | COMMENT |
|---|---|---|---|---|---|---|
| **109.8± 2.4 OUR AVERAGE** | | | | | | |
| 112.0±20.0 | 4700 | [9,10] CLELAND | 82B | SPEC | + | 50 $\pi^+ p \rightarrow K^0_S K^+ p$ |
| 120.0±25.0 | 5200 | [9,10] CLELAND | 82B | SPEC | − | 50 $\pi^- p \rightarrow K^0_S K^- p$ |
| 106.0± 4.0 | 4000 | CHABAUD | 80 | SPEC | − | 17 $\pi^- A \rightarrow K^0_S K^- A$ |
| 126.0±11.0 | 11000 | CHABAUD | 78 | SPEC | − | 9.8 $\pi^- p \rightarrow K^- K^0_S p$ |
| 101.0± 8.0 | 4730 | CHABAUD | 78 | SPEC | − | 18.8 $\pi^- p \rightarrow K^- K^0_S p$ |
| 113 ± 4 | | [9,11] MARTIN | 78D | SPEC | − | 10 $\pi^- p \rightarrow K^0_S K^- p$ |
| 105.0± 8.0 | 2724 | [11] MARGULIE | 76 | SPEC | − | 23 $\pi^- p \rightarrow K^- K^0_S p$ |
| 113.0±19.0 | 730 | FOLEY | 72 | CNTR | − | 20.3 $\pi^- p \rightarrow K^- K^0_S p$ |
| 123.0±13.0 | 1500 | [11] GRAYER | 71 | ASPK | − | 17.2 $\pi^- p \rightarrow K^- K^0_S p$ |
| • • • We do not use the following data for averages, fits, limits, etc. • • • | | | | | | |
| 121.0±51.0 | 1000 | [9,10] CLELAND | 82B | SPEC | + | 30 $\pi^+ p \rightarrow K^0_S K^+ p$ |
| 110.0±18.0 | 350 | HYAMS | 78 | ASPK | + | 12.7 $\pi^+ p \rightarrow K^+ K^0_S p$ |

[9] From a fit to $J^P = 2^+$ partial wave.

[10] Number of events evaluated by us.

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

### $\eta\pi$ MODE

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

| VALUE (MeV) | EVTS | DOCUMENT ID | | TECN | CHG | COMMENT |
|---|---|---|---|---|---|---|
| **110.9± 3.3 OUR AVERAGE** | | | | | | |
| 118 ±10 | | ARMSTRONG | 93C | SPEC | 0 | $\overline{p}p \rightarrow \pi^0\eta\eta \rightarrow 6\gamma$ |
| 103 ± 6 ±3 | | BELADIDZE | 93 | VES | | $37\pi^- N \rightarrow \eta\pi^- N$ |
| 112.2± 5.7 | 2561 | DELFOSSE | 81 | SPEC | + | $\pi^{\pm} p \rightarrow p\pi^{\pm}\eta$ |
| 116.6± 7.7 | 1653 | DELFOSSE | 81 | SPEC | − | $\pi^{\pm} p \rightarrow p\pi^{\pm}\eta$ |
| 108 ± 9 | 1000 | KEY | 73 | OSPK | − | 6 $\pi^- p \rightarrow p\pi^-\eta$ |
| • • • We do not use the following data for averages, fits, limits, etc. • • • | | | | | | |
| 104 ± 9 | 6200 | [12] CONFORTO | 73 | OSPK | − | 6 $\pi^- p \rightarrow p MM^-$ |

[12] Model dependent.

### $\eta'\pi$ MODE

| VALUE (MeV) | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|
| **106±32** | BELADIDZE | 93 | VES | $37\pi^- N \rightarrow \eta'\pi^- N$ |

## $a_2(1320)$ DECAY MODES

| | Mode | Fraction ($\Gamma_i/\Gamma$) | Scale factor/ Confidence level |
|---|---|---|---|
| $\Gamma_1$ | $\rho\pi$ | (70.1±2.7) % | S=1.2 |
| $\Gamma_2$ | $\eta\pi$ | (14.5±1.2) % | |
| $\Gamma_3$ | $\omega\pi\pi$ | (10.6±3.2) % | S=1.3 |
| $\Gamma_4$ | $K\overline{K}$ | ( 4.9±0.8) % | |
| $\Gamma_5$ | $\eta'(958)\pi$ | ( 5.7±1.1) $\times 10^{-3}$ | |
| $\Gamma_6$ | $\pi^{\pm}\gamma$ | ( 2.8±0.6) $\times 10^{-3}$ | |
| $\Gamma_7$ | $\gamma\gamma$ | ( 9.7±1.0) $\times 10^{-6}$ | |
| $\Gamma_8$ | $\pi^+\pi^-\pi^-$ | < 8 % | CL=90% |
| $\Gamma_9$ | $e^+e^-$ | < 2.3 $\times 10^{-7}$ | CL=90% |

## CONSTRAINED FIT INFORMATION

An overall fit to 5 branching ratios uses 18 measurements and one constraint to determine 4 parameters. The overall fit has a $\chi^2 = 9.3$ for 15 degrees of freedom.

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

| | | | |
|---|---|---|---|
| $x_2$ | 10 | | |
| $x_3$ | −89 | −46 | |
| $x_4$ | −1 | −2 | −24 |
| | $x_1$ | $x_2$ | $x_3$ |

## $a_2(1320)$ PARTIAL WIDTHS

### $\Gamma(\pi^{\pm}\gamma)$ — $\Gamma_6$

| VALUE (keV) | DOCUMENT ID | | TECN | CHG | COMMENT |
|---|---|---|---|---|---|
| **295± 60** | CIHANGIR | 82 | SPEC | + | 200 $\pi^+ A$ |
| • • • We do not use the following data for averages, fits, limits, etc. • • • | | | | | |
| 461±110 | [12] MAY | 77 | SPEC | ± | 9.7 $\gamma A$ |

### $\Gamma(\gamma\gamma)$ — $\Gamma_7$

| VALUE (keV) | EVTS | DOCUMENT ID | | TECN | CHG | COMMENT |
|---|---|---|---|---|---|---|
| **1.04±0.09 OUR AVERAGE** | | | | | | |
| 1.26±0.26±0.18 | 36 | BARU | 90 | MD1 | | $e^+e^- \rightarrow e^+e^-\pi^+\pi^-\pi^0$ |
| 1.00±0.07±0.15 | 415 | BEHREND | 90C | CELL | 0 | $e^+e^- \rightarrow e^+e^-\pi^+\pi^-\pi^0$ |
| 1.03±0.13±0.21 | | BUTLER | 90 | MRK2 | | $e^+e^- \rightarrow e^+e^-\pi^+\pi^-\pi^0$ |
| 1.01±0.14±0.22 | 85 | OEST | 90 | JADE | | $e^+e^- \rightarrow e^+e^-\pi^0\eta$ |
| 0.90±0.27±0.15 | 56 | [13] ALTHOFF | 86 | TASS | 0 | $e^+e^- \rightarrow e^+e^- 3\pi$ |
| 1.14±0.20±0.26 | | [14] ANTREASYAN | 86 | CBAL | 0 | $e^+e^- \rightarrow e^+e^-\pi^0\eta$ |
| 1.06±0.18±0.19 | | BERGER | 84C | PLUT | 0 | $e^+e^- \rightarrow e^+e^- 3\pi$ |
| • • • We do not use the following data for averages, fits, limits, etc. • • • | | | | | | |
| $0.81\pm0.19^{+0.42}_{-0.11}$ | 35 | [13] BEHREND | 83B | CELL | 0 | $e^+e^- \rightarrow e^+e^- 3\pi$ |
| 0.84±0.07±0.15 | | [13] FRAZER | 83 | JADE | 0 | $e^+e^- \rightarrow e^+e^- 3\pi$ |
| 0.77±0.18±0.27 | 22 | [14] EDWARDS | 82F | CBAL | 0 | $e^+e^- \rightarrow e^+e^-\pi^0\eta$ |

[13] From $\rho\pi$ decay mode.

[14] From $\eta\pi^0$ decay mode.

### $\Gamma(e^+e^-)$ — $\Gamma_9$

| VALUE (eV) | CL% | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|---|
| **<25** | 90 | VOROBYEV | 88 | ND | $e^+e^- \rightarrow \pi^0\eta$ |

## $a_2(1320)$ $\Gamma(i)\Gamma(\gamma\gamma)/\Gamma(\text{total})$

### $\Gamma(K\overline{K}) \times \Gamma(\gamma\gamma)/\Gamma_{total}$ — $\Gamma_4\Gamma_7/\Gamma$

| VALUE (keV) | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|
| **0.126±0.007±0.028** | [15] ALBRECHT | 90G | ARG | $e^+e^- \rightarrow e^+e^- K^+K^-$ |
| • • • We do not use the following data for averages, fits, limits, etc. • • • | | | | |
| 0.081±0.006±0.027 | [16] ALBRECHT | 90G | ARG | $e^+e^- \rightarrow e^+e^- K^+K^-$ |

[15] Using an incoherent background.

[16] Using a coherent background.