# $K^*(1680)$

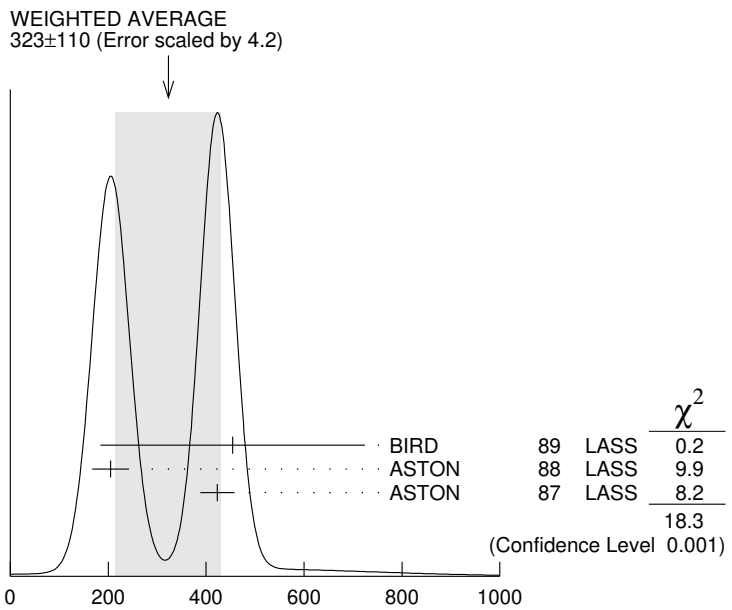
$I(J^P) = \frac{1}{2}(1^-)$

## $K^*(1680)$ MASS

| *VALUE* (MeV) | *DOCUMENT ID* | | *TECN* | *CHG* | *COMMENT* |
|---|---|---|---|---|---|
| **1714±20 OUR AVERAGE** | Error includes scale factor of 1.1. | | | | |
| 1678±64 | BIRD | 89 | LASS | – | 11 $K^- p \rightarrow \overline{K}^0 \pi^- p$ |
| 1677±10±32 | ASTON | 88 | LASS | 0 | 11 $K^- p \rightarrow K^- \pi^+ n$ |
| 1735±10±20 | ASTON | 87 | LASS | 0 | 11 $K^- p \rightarrow \overline{K}^0 \pi^+ \pi^- n$ |
| • • • We do not use the following data for averages, fits, limits, etc. • • • | | | | | |
| 1800±70 | ETKIN | 80 | MPS | 0 | 6 $K^- p \rightarrow \overline{K}^0 \pi^+ \pi^- n$ |
| ~ 1650 | ESTABROOKS | 78 | ASPK | 0 | 13 $K^\pm p \rightarrow K^\pm \pi^\pm n$ |

## $K^*(1680)$ WIDTH

| *VALUE* (MeV) | *DOCUMENT ID* | | *TECN* | *CHG* | *COMMENT* |
|---|---|---|---|---|---|
| **323±110 OUR AVERAGE** | Error includes scale factor of 4.2. See the ideogram below. | | | | |
| 454±270 | BIRD | 89 | LASS | – | 11 $K^- p \rightarrow \overline{K}^0 \pi^- p$ |
| 205± 16±34 | ASTON | 88 | LASS | 0 | 11 $K^- p \rightarrow K^- \pi^+ n$ |
| 423± 18±30 | ASTON | 87 | LASS | 0 | 11 $K^- p \rightarrow \overline{K}^0 \pi^+ \pi^- n$ |
| • • • We do not use the following data for averages, fits, limits, etc. • • • | | | | | |
| 170± 30 | ETKIN | 80 | MPS | 0 | 6 $K^- p \rightarrow \overline{K}^0 \pi^+ \pi^- n$ |
| 250 to 300 | ESTABROOKS | 78 | ASPK | 0 | 13 $K^\pm p \rightarrow K^\pm \pi^\pm n$ |



## $K^*(1680)$ DECAY MODES

| | Mode | Fraction ($\Gamma_i/\Gamma$) |
|---|---|---|
| $\Gamma_1$ | $K\pi$ | (38.7±2.5) % |
| $\Gamma_2$ | $K\rho$ | $(31.4^{+4.7}_{-2.1})$ % |
| $\Gamma_3$ | $K^*(892)\pi$ | $(29.9^{+2.2}_{-4.7})$ % |

## CONSTRAINED FIT INFORMATION

An overall fit to 4 branching ratios uses 4 measurements and one constraint to determine 3 parameters. The overall fit has a $\chi^2 = 2.9$ for 2 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, $x_i \equiv \Gamma_i/\Gamma_{\text{total}}$. The fit constrains the $x_i$ whose labels appear in this array to sum to one.

| | | |
|---|---|---|
| $x_2$ | −36 | |
| $x_3$ | −39 | −72 |
| | $x_1$ | $x_2$ |

## $K^*(1680)$ BRANCHING RATIOS

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

| VALUE | DOCUMENT ID | | TECN | CHG | COMMENT |
|---|---|---|---|---|---|
| **0.387±0.026 OUR FIT** | | | | | |
| **0.388±0.014±0.022** | ASTON | 88 | LASS | 0 | 11 $K^- p \to K^- \pi^+ n$ |

### $\Gamma(K\pi)/\Gamma(K^*(892)\pi)$ — $\Gamma_1/\Gamma_3$

| VALUE | DOCUMENT ID | | TECN | CHG | COMMENT |
|---|---|---|---|---|---|
| $\mathbf{1.30^{+0.23}_{=0.14}}$ **OUR FIT** | | | | | |
| **2.8 ±1.1** | ASTON | 84 | LASS | 0 | 11 $K^- p \to \overline{K}^0 2\pi n$ |

### $\Gamma(K\rho)/\Gamma(K\pi)$ — $\Gamma_2/\Gamma_1$

| VALUE | DOCUMENT ID | | TECN | CHG | COMMENT |
|---|---|---|---|---|---|
| $\mathbf{0.81^{+0.14}_{-0.09}}$ **OUR FIT** | | | | | |
| **1.2 ±0.4** | ASTON | 84 | LASS | 0 | 11 $K^- p \to \overline{K}^0 2\pi n$ |

### $\Gamma(K\rho)/\Gamma(K^*(892)\pi)$ — $\Gamma_2/\Gamma_3$

| VALUE | DOCUMENT ID | | TECN | CHG | COMMENT |
|---|---|---|---|---|---|
| $\mathbf{1.05^{+0.27}_{-0.11}}$ **OUR FIT** | | | | | |
| $\mathbf{0.97\pm0.09^{+0.30}_{-0.10}}$ | ASTON | 87 | LASS | 0 | 11 $K^- p \to \overline{K}^0 \pi^+ \pi^- n$ |

## $K^*(1680)$ REFERENCES


| | | | | |
|---|---|---|---|---|
| BIRD | 89 | SLAC-332 | | (SLAC) |
| ASTON | 88 | NP B296 493 | +Awaji, Bienz, Bird+ | (SLAC, NAGO, CINC, INUS) |
| ASTON | 87 | NP B292 693 | +Awaji, D'Amore+ | (SLAC, NAGO, CINC, INUS) |
| ASTON | 84 | PL 149B 258 | +Carnegie, Dunwoodie+ | (SLAC, CARL, OTTA) JP |
| ETKIN | 80 | PR D22 42 | +Foley, Lindenbaum, Kramer+ | (BNL, CUNY) JP |
| ESTABROOKS | 78 | NP B133 490 | +Carnegie+ | (MCGI, CARL, DURH, SLAC) JP |