

$$\Sigma(1770) \ 1/2^+$$

$$I(J^P) = 1(\frac{1}{2}^+) \ \text{Status: } *$$

OMITTED FROM SUMMARY TABLE

Evidence for this state now rests solely on solution 1 of BAILLON 75, (see the footnotes) but the $\Lambda\pi$ partial-wave amplitudes of this solution are in disagreement with amplitudes from most other $\Lambda\pi$ analyses.

$\Sigma(1770)$ MASS

| <u>VALUE (MeV)</u> | <u>DOCUMENT ID</u> | <u>TECN</u> | <u>COMMENT</u> |
|---|--------------------|-------------|--|
| ≈ 1770 OUR ESTIMATE | | | |
| 1738 \pm 10 | 1 GOPAL | 77 | DPWA $\bar{K}N$ multichannel |
| 1770 \pm 20 | 2 BAILLON | 75 | IPWA $\bar{K}N \rightarrow \Lambda\pi$ |
| 1772 | 3 KANE | 72 | DPWA $K^-p \rightarrow \Sigma\pi$ |

$\Sigma(1770)$ WIDTH

| <u>VALUE (MeV)</u> | <u>DOCUMENT ID</u> | <u>TECN</u> | <u>COMMENT</u> |
|--------------------|--------------------|-------------|--|
| 72 \pm 10 | 1 GOPAL | 77 | DPWA $\bar{K}N$ multichannel |
| 80 \pm 30 | 2 BAILLON | 75 | IPWA $\bar{K}N \rightarrow \Lambda\pi$ |
| 80 | 3 KANE | 72 | DPWA $K^-p \rightarrow \Sigma\pi$ |

$\Sigma(1770)$ DECAY MODES

| <u>Mode</u> | |
|-------------|--------------|
| Γ_1 | $N\bar{K}$ |
| Γ_2 | $\Lambda\pi$ |
| Γ_3 | $\Sigma\pi$ |

$\Sigma(1770)$ BRANCHING RATIOS

See "Sign conventions for resonance couplings" in the Note on Λ and Σ Resonances.

| <u>$\Gamma(N\bar{K})/\Gamma_{\text{total}}$</u> | <u>DOCUMENT ID</u> | <u>TECN</u> | <u>COMMENT</u> | <u>Γ_1/Γ</u> |
|--|--------------------|-------------|------------------------------|-------------------------------------|
| 0.14 \pm 0.04 | 1 GOPAL | 77 | DPWA $\bar{K}N$ multichannel | |

| <u>$(\Gamma_i\Gamma_f)^{1/2}/\Gamma_{\text{total}}$ in $N\bar{K} \rightarrow \Sigma(1770) \rightarrow \Lambda\pi$</u> | <u>DOCUMENT ID</u> | <u>TECN</u> | <u>COMMENT</u> | <u>$(\Gamma_1\Gamma_2)^{1/2}/\Gamma$</u> |
|---|--------------------|-------------|--|---|
| < 0.04 | GOPAL | 77 | DPWA $\bar{K}N$ multichannel | |
| -0.08 \pm 0.02 | 2 BAILLON | 75 | IPWA $\bar{K}N \rightarrow \Lambda\pi$ | |

| $(\Gamma_i \Gamma_f)^{1/2} / \Gamma_{\text{total}}$ in $N\bar{K} \rightarrow \Sigma(1770) \rightarrow \Sigma\pi$ | | | | $(\Gamma_1 \Gamma_3)^{1/2} / \Gamma$ |
|--|-------------------|------|------------------------------------|--------------------------------------|
| VALUE | DOCUMENT ID | TECN | COMMENT | |
| < 0.04 | GOPAL | 77 | DPWA $\bar{K}N$ multichannel | |
| -0.108 | ³ KANE | 72 | DPWA $K^- p \rightarrow \Sigma\pi$ | |

$\Sigma(1770)$ FOOTNOTES

¹ Required to fit the isospin-1 total cross section of CARROLL 76 in the $\bar{K}N$ channel. The addition of new $K^- p$ polarization and $K^- n$ differential cross-section data in GOPAL 80 find it to be more consistent with the $\Sigma(1660) P_{11}$.

² From solution 1 of BAILLON 75; not present in solution 2.

³ Not required in KANE 74, which supersedes KANE 72.

$\Sigma(1770)$ REFERENCES

| | | | | |
|---------|----|-------------------|-------------------------------|------------------|
| GOPAL | 80 | Toronto Conf. 159 | G.P. Gopal | (RHEL) |
| GOPAL | 77 | NP B119 362 | G.P. Gopal <i>et al.</i> | (LOIC, RHEL) IJP |
| CARROLL | 76 | PRL 37 806 | A.S. Carroll <i>et al.</i> | (BNL) I |
| BAILLON | 75 | NP B94 39 | P.H. Baillon, P.J. Litchfield | (CERN, RHEL) IJP |
| KANE | 74 | LBL-2452 | D.F. Kane | (LBL) IJP |
| KANE | 72 | PR D5 1583 | D.F.J. Kane | (LBL) |