

# $\Sigma(1770) P_{11}$

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

**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>
<b><math>\approx 1770</math> OUR ESTIMATE</b>			
1738 ± 10	1 GOPAL	77 DPWA	$\bar{K}N$ multichannel
1770 ± 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 ± 10	1 GOPAL	77 DPWA	$\bar{K}N$ multichannel
80 ± 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

Mode
$\Gamma_1 \quad N\bar{K}$
$\Gamma_2 \quad \Lambda\pi$
$\Gamma_3 \quad \Sigma\pi$

### $\Sigma(1770)$ BRANCHING RATIOS

See "Sign conventions for resonance couplings" in the Note on  $\Lambda$  and  $\Sigma$  Resonances.

<u><math>\Gamma(N\bar{K})/\Gamma_{\text{total}}</math></u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	$\Gamma_1/\Gamma$
0.14 ± 0.04	1 GOPAL	77 DPWA	$\bar{K}N$ multichannel	

<u><math>(\Gamma_i\Gamma_f)^{1/2}/\Gamma_{\text{total}}</math> in <math>N\bar{K} \rightarrow \Sigma(1770) \rightarrow \Lambda\pi</math></u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	$(\Gamma_1\Gamma_2)^{1/2}/\Gamma$
< 0.04	GOPAL	77 DPWA	$\bar{K}N$ multichannel	
-0.08 ± 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	<sup>3</sup> KANE	72	DPWA	$K^- p \rightarrow \Sigma\pi$

### $\Sigma(1770)$ FOOTNOTES

<sup>1</sup> 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  $\Sigma(1660) P_{11}$ .

<sup>2</sup> From solution 1 of BAILLON 75; not present in solution 2.

<sup>3</sup> 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)