

$\Sigma(1770) P_{11}$

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

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

$\Sigma(1770)$ WIDTH

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

$\Sigma(1770)$ DECAY MODES

Mode
Γ_1 $N\overline{K}$
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.

$\Gamma(N\overline{K})/\Gamma_{\text{total}}$				Γ_1/Γ
VALUE	DOCUMENT ID	TECN	COMMENT	
0.14 $\pm$ 0.04	¹ GOPAL	77	DPWA $\overline{K}N$ multichannel	
$(\Gamma_i\Gamma_f)^{1/2}/\Gamma_{\text{total}}$ in $N\overline{K} \rightarrow \Sigma(1770) \rightarrow \Lambda\pi$				$(\Gamma_1\Gamma_2)^{1/2}/\Gamma$
VALUE	DOCUMENT ID	TECN	COMMENT	
< 0.04	GOPAL	77	DPWA $\overline{K}N$ multichannel	
-0.08 $\pm$ 0.02	² BAILLON	75	IPWA $\overline{K}N \rightarrow \Lambda\pi$	

$(\Gamma_i \Gamma_f)^{1/2} / \Gamma_{\text{total}}$ 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)