$\Sigma(1840)\ P_{13}$

$I(J^P) = 1(\frac{3}{2}^+)$ Status: $*$

OMITTED FROM SUMMARY TABLE

For the time being, we list together here all resonance claims in the P_{13} wave between 1700 and 1900 MeV.

Σ(1840) MASS

VALUE (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
≈ 1840 OUR ESTIMATE				
1798 or 1802	[1] MARTIN	77	DPWA	$\overline{K}N$ multichannel
1720 ± 30	[2] BAILLON	75	IPWA	$\overline{K}N \to \Lambda\pi$
1925 ± 200	VANHORN	75	DPWA	$K^- p \to \Lambda\pi^0$
1840 ± 10	LANGBEIN	72	IPWA	$\overline{K}N$ multichannel

Σ(1840) WIDTH

VALUE (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
93 or 93	[1] MARTIN	77	DPWA	$\overline{K}N$ multichannel
120 ± 30	[2] BAILLON	75	IPWA	$\overline{K}N \to \Lambda\pi$
65^{+50}_{-20}	VANHORN	75	DPWA	$K^- p \to \Lambda\pi^0$
120 ± 10	LANGBEIN	72	IPWA	$\overline{K}N$ multichannel

Σ(1840) DECAY MODES

	Mode
Γ_1	$N\overline{K}$
Γ_2	$\Lambda\pi$
Γ_3	$\Sigma\pi$

Σ(1840) 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 or 0	[1] MARTIN	77	DPWA	$\overline{K}N$ multichannel
0.37 ± 0.13	LANGBEIN	72	IPWA	$\overline{K}N$ multichannel

$(\Gamma_i\Gamma_f)^{1/2}/\Gamma_{\text{total}}$ in $N\overline{K} \to \Sigma(1840) \to \Lambda\pi$ — $(\Gamma_1\Gamma_2)^{1/2}/\Gamma$

VALUE	*DOCUMENT ID*		*TECN*	*COMMENT*
+0.03 or +0.03	[1] MARTIN	77	DPWA	$\overline{K}N$ multichannel
+0.11 ± 0.02	[2] BAILLON	75	IPWA	$\overline{K}N \to \Lambda\pi$
+0.06 ± 0.04	VANHORN	75	DPWA	$K^- p \to \Lambda\pi^0$
+0.122 ± 0.078	DEVENISH	74B		Fixed-t dispersion rel.
0.20 ± 0.04	LANGBEIN	72	IPWA	$\overline{K}N$ multichannel

$(\Gamma_i\Gamma_f)^{1/2}/\Gamma_{total}$ in $N\overline{K} \rightarrow \Sigma(1840) \rightarrow \Sigma\pi$ **$(\Gamma_1\Gamma_3)^{1/2}/\Gamma$**

VALUE	*DOCUMENT ID*		*TECN*	*COMMENT*
-0.04 or -0.04	[1] MARTIN	77	DPWA	$\overline{K}N$ multichannel
0.15 ± 0.04	LANGBEIN	72	IPWA	$\overline{K}N$ multichannel

$\Sigma(1840)$ FOOTNOTES

[1] The two MARTIN 77 values are from a T-matrix pole and from a Breit-Wigner fit.
[2] From solution 1 of BAILLON 75; not present in solution 2.

$\Sigma(1840)$ REFERENCES

MARTIN	77	NP B127 349	+Pidcock, Moorhouse	(LOUC, GLAS) IJP
Also	77B	NP B126 266	Martin, Pidcock	(LOUC)
Also	77C	NP B126 285	Martin, Pidcock	(LOUC) IJP
BAILLON	75	NP B94 39	+Litchfield	(CERN, RHEL) IJP
VANHORN	75	NP B87 145		(LBL) IJP
Also	75B	NP B87 157	VanHorn	(LBL) IJP
DEVENISH	74B	NP B81 330	+Froggatt, Martin	(DESY, NORD, LOUC)
LANGBEIN	72	NP B47 477	+Wagner	(MPIM) IJP