

$\Sigma(1840) P_{13}$

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

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.

$\Sigma(1840)$ MASS

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

$\Sigma(1840)$ WIDTH

<u>VALUE (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
93 or 93	¹ MARTIN	77	DPWA $\bar{K}N$ multichannel
120 ± 30	² BAILLON	75	IPWA $\bar{K}N \rightarrow \Lambda\pi$
65^{+50}_{-20}	VANHORN	75	DPWA $K^- p \rightarrow \Lambda\pi^0$
120 ± 10	LANGBEIN	72	IPWA $\bar{K}N$ multichannel

$\Sigma(1840)$ DECAY MODES

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

$\Sigma(1840)$ BRANCHING RATIOS

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

$\Gamma(N\bar{K})/\Gamma_{\text{total}}$				Γ_1/Γ
<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
0 or 0	¹ MARTIN	77	DPWA $\bar{K}N$ multichannel	
0.37 ± 0.13	LANGBEIN	72	IPWA $\bar{K}N$ multichannel	

$(\Gamma_i/\Gamma_f)^{1/2}/\Gamma_{\text{total}}$ in $N\bar{K} \rightarrow \Sigma(1840) \rightarrow \Lambda\pi$				$(\Gamma_1\Gamma_2)^{1/2}/\Gamma$
<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
$+0.03$ or $+0.03$	¹ MARTIN	77	DPWA $\bar{K}N$ multichannel	
$+0.11 \pm 0.02$	² BAILLON	75	IPWA $\bar{K}N \rightarrow \Lambda\pi$	
$+0.06 \pm 0.04$	VANHORN	75	DPWA $K^- p \rightarrow \Lambda\pi^0$	
$+0.122 \pm 0.078$	DEVENISH	74B	Fixed- t dispersion rel.	
0.20 ± 0.04	LANGBEIN	72	IPWA $\bar{K}N$ multichannel	

$(\Gamma_i \Gamma_f)^{1/2} / \Gamma_{\text{total}}$ in $N\bar{K} \rightarrow \Sigma(1840) \rightarrow \Sigma\pi$				$(\Gamma_1 \Gamma_3)^{1/2} / \Gamma$
VALUE	DOCUMENT ID	TECN	COMMENT	
-0.04 or -0.04	¹ MARTIN	77	DPWA	$\bar{K}N$ multichannel
0.15 ± 0.04	LANGBEIN	72	IPWA	$\bar{K}N$ 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