$(\Gamma_i\Gamma_f)^{1/2}/\Gamma_{total}$ in $N\overline{K} \to \Sigma(1775) \to \Lambda\pi$ — $(\Gamma_1\Gamma_2)^{1/2}/\Gamma$

VALUE	DOCUMENT ID		TECN	COMMENT
0.305±0.018 OUR FIT Error includes scale factor of 2.4.				
−0.262±0.015 OUR AVERAGE				
−0.28 ±0.03	GOPAL	77	DPWA	$\overline{K}N$ multichannel
−0.25 ±0.02	BAILLON	75	IPWA	$\overline{K}N \to \Lambda\pi$
$-0.28\ ^{+0.04}_{-0.05}$	VANHORN	75	DPWA	$K^-p \to \Lambda\pi^0$
−0.259±0.048	DEVENISH	74B		Fixed-t dispersion rel.
• • • We do not use the following data for averages, fits, limits, etc. • • •				
−0.29 or −0.28	[1] MARTIN	77	DPWA	$\overline{K}N$ multichannel
−0.30	DEBELLEFON	76	IPWA	$K^-p \to \Lambda\pi^0$

$(\Gamma_i\Gamma_f)^{1/2}/\Gamma_{total}$ in $N\overline{K} \to \Sigma(1775) \to \Sigma\pi$ — $(\Gamma_1\Gamma_3)^{1/2}/\Gamma$

VALUE	DOCUMENT ID		TECN	COMMENT
0.105±0.025 OUR FIT Error includes scale factor of 3.1.				
0.098±0.016 OUR AVERAGE Error includes scale factor of 1.8.				
+0.13 ±0.02	GOPAL	77	DPWA	$\overline{K}N$ multichannel
0.09 ±0.01	KANE	74	DPWA	$K^-p \to \Sigma\pi$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
+0.08 or +0.08	[1] MARTIN	77	DPWA	$\overline{K}N$ multichannel

$(\Gamma_i\Gamma_f)^{1/2}/\Gamma_{total}$ in $N\overline{K} \to \Sigma(1775) \to \Lambda(1520)\pi$ — $(\Gamma_1\Gamma_6)^{1/2}/\Gamma$

VALUE	DOCUMENT ID		TECN	COMMENT
0.315±0.010 OUR FIT Error includes scale factor of 1.5.				
0.303±0.009 OUR AVERAGE Signs on measurements were ignored.				
−0.305±0.010	[2] CAMERON	77	DPWA	$K^-p \to \Lambda(1520)\pi^0$
0.31 ±0.02	BARLETTA	72	DPWA	$K^-p \to \Lambda(1520)\pi^0$
0.27 ±0.03	ARMENTEROS	65C	HBC	$K^-p \to \Lambda(1520)\pi^0$

$(\Gamma_i\Gamma_f)^{1/2}/\Gamma_{total}$ in $N\overline{K} \to \Sigma(1775) \to \Sigma(1385)\pi$ — $(\Gamma_1\Gamma_4)^{1/2}/\Gamma$

VALUE	DOCUMENT ID		TECN	COMMENT
0.211±0.022 OUR FIT Error includes scale factor of 2.8.				
0.188±0.010 OUR AVERAGE Signs on measurements were ignored.				
−0.184±0.011	[3] CAMERON	78	DPWA	$K^-p \to \Sigma(1385)\pi$
+0.20 ±0.02	PREVOST	74	DPWA	$K^-N \to \Sigma(1385)\pi$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.32 ±0.06	SIMS	68	DBC	$K^-N \to \Lambda\pi\pi$
0.24 ±0.03	ARMENTEROS	67C	HBC	$K^-p \to \Lambda\pi\pi$

$\Gamma(\Lambda\pi)/\Gamma(N\overline{K})$ — Γ_2/Γ_1

VALUE	DOCUMENT ID		TECN	COMMENT
0.46±0.09 OUR FIT Error includes scale factor of 2.9.				
0.33±0.05	UHLIG	67	HBC	K^-p 0.9 GeV/c

$\Gamma(\Sigma\pi\pi)/\Gamma_{total}$ — Γ_7/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.12	[4] ARMENTEROS	68C	HDBC	$K^-N \to \Sigma\pi\pi$

$\Gamma(\Sigma(1385)\pi)/\Gamma(N\overline{K})$ — Γ_4/Γ_1

VALUE	DOCUMENT ID		TECN	COMMENT
0.22±0.07 OUR FIT Error includes scale factor of 3.6.				
0.25±0.09	UHLIG	67	HBC	K^-p 0.9 GeV/c

$\Gamma(\Lambda(1520)\pi)/\Gamma(N\overline{K})$ — Γ_6/Γ_1

VALUE	DOCUMENT ID		TECN	COMMENT
0.49±0.11 OUR FIT Error includes scale factor of 3.5.				
0.28±0.05	UHLIG	67	HBC	K^-p 0.9 GeV/c

$\Sigma(1775)$ FOOTNOTES

[1] The two MARTIN 77 values are from a T-matrix pole and from a Breit-Wigner fit.

[2] This rate combines P-wave- and F-wave decays. The CAMERON 77 results for the separate P-wave- and F-wave decays are -0.303 ± 0.010 and -0.037 ± 0.014. The published signs have been changed here to be in accord with the baryon-first convention.

[3] The CAMERON 78 upper limit on G-wave decay is 0.03.

[4] For about 3/4 of this, the $\Sigma\pi$ system has $I = 0$ and is almost entirely $\Lambda(1520)$. For the rest, the $\Sigma\pi$ has $I = 1$, which is about what is expected from the known $\Sigma(1775) \to \Sigma(1385)\pi$ rate, as seen in $\Lambda\pi\pi$.

$\Sigma(1775)$ REFERENCES

PDG	82	PL 111B	Roos, Porter, Aguilar-Benitez+	(HELS, CIT, CERN)
GOPAL	80	Toronto Conf. 159		(RHEL) IJP
ALSTON-...	78	PR D18 182	Alston-Garnjost, Kenney+	(LBL, MTHO, CERN) IJP
Also	77	PRL 38 1007	Alston-Garnjost, Kenney+	(LBL, MTHO, CERN) IJP
CAMERON	78	NP B143 189	+Franek, Gopal, Bacon, Butterworth+	(RHEL, LOIC) IJP
CAMERON	77	NP B131 399	+Franek, Gopal, Kalmus, McPherson+	(RHEL, LOIC) IJP
GOPAL	77	NP B119 362	+Ross, VanHorn, McPherson+	(LOIC, RHEL) IJP
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
DEBELLEFON	76	NP B109 129	De Bellefon, Berthon	(CDEF) 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)
KANE	74	LBL-2452		(LBL) IJP
PREVOST	74	NP B69 246	+Barloutaud+	(SACL, CERN, HEID)
BARLETTA	72	NP B40 45		(EFI) IJP
Also	66	PRL 17 841	Fenster, Gelfand, Harmsen+	(CHIC, ANL, CERN) IJP
ARMENTEROS	68C	NP B8 216	+Baillon+	(CERN, HEID, SACL) I
SIMS	68	PRL 21 1413	+Albright, Bartley, Meer+	(FSU, TUFTS, BRAN)
ARMENTEROS	67C	ZPHY 202 486	+Ferro-Luzzi+	(CERN, HEID, SACL)
UHLIG	67	PR 155 1448	+Charlton, Condon, Glasser, Yodh+	(UMD, NRL)
ARMENTEROS	65C	PL 19 338	+Ferro-Luzzi+	(CERN, HEID, SACL) IJP
GALTIERI	63	PL 6 296	+Hussain, Tripp	(LRL) IJ

$\Sigma(1840)$ 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.

$\Sigma(1840)$ 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

$\Sigma(1840)$ 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

$\Sigma(1840)$ DECAY MODES

	Mode
Γ_1	$N\overline{K}$
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.

$\Gamma(N\overline{K})/\Gamma_{total}$ — 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

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

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