NODE=B036

$\Lambda(1800)\ 1/2^-$

$I(J^P) = 0(\frac{1}{2}^-)$ Status: ***

$\Lambda(1800)$ POLE POSITION

NODE=B036225

REAL PART

NODE=B036RE
NODE=B036RE

VALUE (MeV)	DOCUMENT ID		TECN	COMMENT
1809±9	SARANTSEV	19	DPWA	$\overline{K}N$ multichannel
• • • We do not use the following data for averages, fits, limits, etc. • • •				
1729	ZHANG	13A	DPWA	Multichannel

−2×IMAGINARY PART

NODE=B036IM
NODE=B036IM

VALUE (MeV)	DOCUMENT ID		TECN	COMMENT
205±16	SARANTSEV	19	DPWA	$\overline{K}N$ multichannel
• • • We do not use the following data for averages, fits, limits, etc. • • •				
198	ZHANG	13A	DPWA	Multichannel

$\Lambda(1800)$ POLE RESIDUES

NODE=B036250

The normalized residue is the residue divided by $\Gamma_{pole}/2$.

NODE=B036250

Normalized residue in $N\overline{K} \to \Lambda(1800) \to N\overline{K}$

NODE=B036A00
NODE=B036A00

MODULUS	PHASE (°)	DOCUMENT ID		TECN	COMMENT
0.34±0.07	**103 ± 8**	SARANTSEV	19	DPWA	$\overline{K}N$ multichannel

Normalized residue in $N\overline{K} \to \Lambda(1800) \to \Sigma\pi$

NODE=B036A01
NODE=B036A01

MODULUS	PHASE (°)	DOCUMENT ID		TECN	COMMENT
0.30±0.06	**−123 ± 8**	SARANTSEV	19	DPWA	$\overline{K}N$ multichannel

Normalized residue in $N\overline{K} \to \Lambda(1800) \to \Lambda\eta$

NODE=B036A02
NODE=B036A02

MODULUS	PHASE (°)	DOCUMENT ID		TECN	COMMENT
0.06±0.03	**75 ± 10**	SARANTSEV	19	DPWA	$\overline{K}N$ multichannel

Normalized residue in $N\overline{K} \to \Lambda(1800) \to \Lambda\sigma$

NODE=B036A03
NODE=B036A03

MODULUS	PHASE (°)	DOCUMENT ID		TECN	COMMENT
0.24±0.05	**25 ± 10**	SARANTSEV	19	DPWA	$\overline{K}N$ multichannel

Normalized residue in $N\overline{K} \to \Lambda(1800) \to \Lambda\omega$, S=1/2, S-wave

NODE=B036A07
NODE=B036A07

MODULUS	PHASE (°)	DOCUMENT ID		TECN	COMMENT
0.12±0.04	**−114 ± 30**	SARANTSEV	19	DPWA	$\overline{K}N$ multichannel

Normalized residue in $N\overline{K} \to \Lambda(1800) \to \Lambda\omega$, S=3/2, D-wave

NODE=B036A08
NODE=B036A08

MODULUS	PHASE (°)	DOCUMENT ID		TECN	COMMENT
0.08±0.03	**−90 ± 17**	SARANTSEV	19	DPWA	$\overline{K}N$ multichannel

Normalized residue in $N\overline{K} \to \Lambda(1800) \to \Sigma(1385)\pi$

NODE=B036A04
NODE=B036A04

MODULUS	PHASE (°)	DOCUMENT ID		TECN	COMMENT
0.16±0.06	**−140 ± 35**	SARANTSEV	19	DPWA	$\overline{K}N$ multichannel

Normalized residue in $N\overline{K} \to \Lambda(1800) \to N\overline{K}^*(892)$, S=1/2, S-wave

NODE=B036A05
NODE=B036A05

MODULUS	PHASE (°)	DOCUMENT ID		TECN	COMMENT
0.18±0.06	**65 ± 40**	SARANTSEV	19	DPWA	$\overline{K}N$ multichannel

Normalized residue in $N\overline{K} \to \Lambda(1800) \to N\overline{K}^*(892)$, S=3/2, D-wave

NODE=B036A06
NODE=B036A06

MODULUS	PHASE (°)	DOCUMENT ID		TECN	COMMENT
0.09±0.07		SARANTSEV	19	DPWA	$\overline{K}N$ multichannel

$\Lambda(1800)$ MASS

NODE=B036M

VALUE (MeV)	DOCUMENT ID		TECN	COMMENT
1750 to 1850 (≈ 1800) OUR ESTIMATE				
1800.9±13.3±12.6	ABLIKIM	25AF	BES3	$\psi(3686) \to \Lambda\overline{\Sigma}^0\pi^0 +$ c.c. (PWA)
1811 ±10	SARANTSEV	19	DPWA	$\overline{K}N$ multichannel
1783 ±19	ZHANG	13A	DPWA	$\overline{K}N$ multichannel

NODE=B036M

→ UNCHECKED ←

1841 ±10	GOPAL	80	DPWA	$\overline{K}N \to \overline{K}N$
1725 ±20	ALSTON-...	78	DPWA	$\overline{K}N \to \overline{K}N$
1830 ±20	LANGBEIN	72	IPWA	$\overline{K}N$ multichannel
• • • We do not use the following data for averages, fits, limits, etc. • • •				
1845 ±10	MANLEY	02	DPWA	$\overline{K}N$ multichannel
1825 ±20	GOPAL	77	DPWA	$\overline{K}N$ multichannel
1767 or 1842	[1] MARTIN	77	DPWA	$\overline{K}N$ multichannel
1780	KIM	71	DPWA	K-matrix analysis
1872 ±10	BRICMAN	70B	DPWA	$\overline{K}N \to \overline{K}N$

Λ(1800) WIDTH

NODE=B036W

VALUE (MeV)	DOCUMENT ID		TECN	COMMENT
150 to 250 (≈ 200) OUR ESTIMATE				
208.8±14.5±36.7	ABLIKIM	25AF	BES3	$\psi(3686) \to \Lambda\overline{\Sigma}^0\pi^0 +$ c.c. (PWA)
209 ±18	SARANTSEV	19	DPWA	$\overline{K}N$ multichannel
256 ±35	ZHANG	13A	DPWA	$\overline{K}N$ multichannel
228 ±20	GOPAL	80	DPWA	$\overline{K}N \to \overline{K}N$
185 ±20	ALSTON-...	78	DPWA	$\overline{K}N \to \overline{K}N$
70 ±15	LANGBEIN	72	IPWA	$\overline{K}N$ multichannel
• • • We do not use the following data for averages, fits, limits, etc. • • •				
518 ±84	MANLEY	02	DPWA	$\overline{K}N$ multichannel
230 ±20	GOPAL	77	DPWA	$\overline{K}N$ multichannel
435 or 473	[1] MARTIN	77	DPWA	$\overline{K}N$ multichannel
40	KIM	71	DPWA	K-matrix analysis
100 ±20	BRICMAN	70B	DPWA	$\overline{K}N \to \overline{K}N$

NODE=B036W
NODE=B036W
→ UNCHECKED ←

Λ(1800) DECAY MODES

NODE=B036215;NODE=B036

	Mode	Fraction (Γ_i/Γ)	
Γ_1	$N\overline{K}$	25–40 %	DESIG=1;OUR EST
Γ_2	$\Sigma\pi$	(27 ±6) %	DESIG=2
Γ_3	$\Lambda\sigma$	(15 ±4) %	DESIG=8
Γ_4	$\Sigma(1385)\pi$	(9 ±4) %	DESIG=3
Γ_5	$\Lambda\eta$	0.01 to 0.10	DESIG=7
Γ_6	$N\overline{K}^*(892)$	seen	DESIG=6;OUR EST
Γ_7	$N\overline{K}^*(892)$, S=1/2, S-wave		DESIG=4
Γ_8	$N\overline{K}^*(892)$, S=3/2, D-wave		DESIG=5

Λ(1800) BRANCHING RATIOS

NODE=B036220

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

NODE=B036220

$\Gamma(N\overline{K})/\Gamma_{total}$ Γ_1/Γ

NODE=B036R1

VALUE	DOCUMENT ID		TECN	COMMENT
0.25 to 0.40 OUR ESTIMATE				
0.35±0.07	SARANTSEV	19	DPWA	$\overline{K}N$ multichannel
0.13±0.06	ZHANG	13A	DPWA	$\overline{K}N$ multichannel
0.36±0.04	GOPAL	80	DPWA	$\overline{K}N \to \overline{K}N$
0.28±0.05	ALSTON-...	78	DPWA	$\overline{K}N \to \overline{K}N$
0.35±0.15	LANGBEIN	72	IPWA	$\overline{K}N$ multichannel
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.24±0.10	MANLEY	02	DPWA	$\overline{K}N$ multichannel
0.37±0.05	GOPAL	77	DPWA	See GOPAL 80
1.21 or 0.70	[1] MARTIN	77	DPWA	$\overline{K}N$ multichannel
0.80	KIM	71	DPWA	K-matrix analysis
0.18±0.02	BRICMAN	70B	DPWA	$\overline{K}N \to \overline{K}N$

NODE=B036R1
NODE=B036R1
→ UNCHECKED ←

$\Gamma(\Sigma\pi)/\Gamma_{total}$ Γ_2/Γ

NODE=B036R00

VALUE	DOCUMENT ID		TECN	COMMENT
0.27±0.06	SARANTSEV	19	DPWA	$\overline{K}N$ multichannel

NODE=B036R00

$\Gamma(\Lambda\sigma)/\Gamma_{total}$ Γ_3/Γ

NODE=B036R02
NODE=B036R02

VALUE	DOCUMENT ID		TECN	COMMENT
0.15±0.04	SARANTSEV	19	DPWA	$\overline{K}N$ multichannel

$\Gamma(\Sigma(1385)\pi)/\Gamma_{total}$ Γ_4/Γ

NODE=B036R03
NODE=B036R03

VALUE	DOCUMENT ID		TECN	COMMENT
0.09±0.04	SARANTSEV	19	DPWA	$\overline{K}N$ multichannel

$\Gamma(\Lambda\eta)/\Gamma_{total}$ Γ_5/Γ

NODE=B036R01
NODE=B036R01

VALUE	DOCUMENT ID		TECN	COMMENT
0.01 to 0.10 OUR ESTIMATE				→ UNCHECKED ←
0.010±0.005	SARANTSEV	19	DPWA	$\overline{K}N$ multichannel
0.06 ±0.05	ZHANG	13A	DPWA	Multichannel

$(\Gamma_i\Gamma_f)^{1/2}/\Gamma_{total}$ in $N\overline{K}\to\Lambda(1800)\to\Sigma\pi$ $(\Gamma_1\Gamma_2)^{1/2}/\Gamma$

NODE=B036R2
NODE=B036R2

VALUE	DOCUMENT ID		TECN	COMMENT
−0.07±0.02	ZHANG	13A	DPWA	Multichannel
−0.08±0.05	GOPAL	77	DPWA	$\overline{K}N$ multichannel
• • • We do not use the following data for averages, fits, limits, etc. • • •				
−0.74 or −0.43	[1] MARTIN	77	DPWA	$\overline{K}N$ multichannel
0.24	KIM	71	DPWA	K-matrix analysis

$(\Gamma_i\Gamma_f)^{1/2}/\Gamma_{total}$ in $N\overline{K}\to\Lambda(1800)\to\Sigma(1385)\pi$ $(\Gamma_1\Gamma_4)^{1/2}/\Gamma$

NODE=B036R3
NODE=B036R3

VALUE	DOCUMENT ID		TECN	COMMENT
−0.09 ±0.05	ZHANG	13A	DPWA	Multichannel
+0.056±0.028	[2] CAMERON	78	DPWA	$K^-p\to\ \Sigma(1385)\pi$

$(\Gamma_i\Gamma_f)^{1/2}/\Gamma_{total}$ in $N\overline{K}\to\Lambda(1800)\to N\overline{K}^*(892)$, S=1/2, S-wave $(\Gamma_1\Gamma_7)^{1/2}/\Gamma$

NODE=B036R4
NODE=B036R4

VALUE	DOCUMENT ID		TECN	COMMENT
−0.13±0.02	ZHANG	13A	DPWA	Multichannel
−0.17±0.03	[2] CAMERON	78B	DPWA	$K^-p\to\ N\overline{K}^*$

$(\Gamma_i\Gamma_f)^{1/2}/\Gamma_{total}$ in $N\overline{K}\to\Lambda(1800)\to N\overline{K}^*(892)$, S=3/2, D-wave $(\Gamma_1\Gamma_8)^{1/2}/\Gamma$

NODE=B036R5
NODE=B036R5

VALUE	DOCUMENT ID		TECN	COMMENT
−0.13±0.04	CAMERON	78B	DPWA	$K^-p\to\ N\overline{K}^*$

$\Lambda(1800)$ FOOTNOTES

NODE=B036

[1] The two MARTIN 77 values are from a T-matrix pole and from a Breit-Wigner fit.
NODE=B036;LINKAGE=A

[2] The published sign has been changed to be in accord with the baryon-first convention.
NODE=B036;LINKAGE=C

$\Lambda(1800)$ REFERENCES

NODE=B036

ABLIKIM	25AF	JHEP 2502 212	M. Ablikim *et al.*	(BESIII Collab.)		REFID=63277
SARANTSEV	19	EPJ A55 180	A.V. Sarantsev *et al.*	(BONN, PNPI)		REFID=59986
ZHANG	13A	PR C88 035205	H. Zhang *et al.*	(KSU)		REFID=55441
MANLEY	02	PRL 88 012002	D.M. Manley *et al.*	(BNL Crystal Ball Collab.)		REFID=48517
GOPAL	80	Toronto Conf. 159	G.P. Gopal	(RHEL)	IJP	REFID=31755
ALSTON-...	78	PR D18 182	M. Alston-Garnjost *et al.*	(LBL, MTHO+)	IJP	REFID=31751
Also		PRL 38 1007	M. Alston-Garnjost *et al.*	(LBL, MTHO+)	IJP	REFID=31752
CAMERON	78	NP B143 189	W. Cameron *et al.*	(RHEL, LOIC)	IJP	REFID=31837
CAMERON	78B	NP B146 327	W. Cameron *et al.*	(RHEL, LOIC)	IJP	REFID=31838
GOPAL	77	NP B119 362	G.P. Gopal *et al.*	(LOIC, RHEL)	IJP	REFID=31750
MARTIN	77	NP B127 349	B.R. Martin, M.K. Pidcock, R.G. Moorhouse	(LOUC+)	IJP	REFID=31762
Also		NP B126 266	B.R. Martin, M.K. Pidcock	(LOUC)		REFID=31763
Also		NP B126 285	B.R. Martin, M.K. Pidcock	(LOUC)	IJP	REFID=31764
LANGBEIN	72	NP B47 477	W. Langbein, F. Wagner	(MPIM)	IJP	REFID=31758
KIM	71	PRL 27 356	J.K. Kim	(HARV)	IJP	REFID=31740
Also		Duke Conf. 161 Hyperon Resonances, 1970	J.K. Kim	(HARV)	IJP	REFID=31741
BRICMAN	70B	PL 33B 511	C. Bricman, M. Ferro-Luzzi, J.P. Lagnaux	(CERN)	IJP	REFID=31873