$\Sigma(1900)\ 1/2^-$

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

OMITTED FROM SUMMARY TABLE

Σ(1900) POLE POSITION

REAL PART

VALUE	DOCUMENT ID		TECN	COMMENT
1936±10	SARANTSEV	19	DPWA	$\overline{K}N$ multichannel

−2×IMAGINARY PART

VALUE	DOCUMENT ID		TECN	COMMENT
150±25	SARANTSEV	19	DPWA	$\overline{K}N$ multichannel

Σ(1900) POLE RESIDUES

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

Normalized residue in $N\overline{K} \to \Sigma(1900) \to N\overline{K}$

MODULUS	PHASE (°)	DOCUMENT ID		TECN	COMMENT
0.45±0.09	**90 ± 25**	SARANTSEV	19	DPWA	$\overline{K}N$ multichannel

Normalized residue in $N\overline{K} \to \Sigma(1900) \to \Sigma\pi$

MODULUS	PHASE (°)	DOCUMENT ID		TECN	COMMENT
0.38±0.08	**95 ± 20**	SARANTSEV	19	DPWA	$\overline{K}N$ multichannel

Normalized residue in $N\overline{K} \to \Sigma(1900) \to \Sigma\eta$

MODULUS	PHASE (°)	DOCUMENT ID		TECN	COMMENT
0.03±0.01	**20 ± 20**	SARANTSEV	19	DPWA	$\overline{K}N$ multichannel

Normalized residue in $N\overline{K} \to \Sigma(1900) \to \Lambda\pi$

MODULUS	PHASE (°)	DOCUMENT ID		TECN	COMMENT
0.14±0.05	**−160 ± 50**	SARANTSEV	19	DPWA	$\overline{K}N$ multichannel

Normalized residue in $N\overline{K} \to \Sigma(1900) \to \Xi K$

MODULUS	PHASE (°)	DOCUMENT ID		TECN	COMMENT
0.08±0.05	**75 ± 25**	SARANTSEV	19	DPWA	$\overline{K}N$ multichannel

Normalized residue in $N\overline{K} \to \Sigma(1900) \to \Sigma(1385)\pi$

MODULUS	PHASE (°)	DOCUMENT ID		TECN	COMMENT
0.16±0.05	**40 ± 30**	SARANTSEV	19	DPWA	$\overline{K}N$ multichannel

Normalized residue in $N\overline{K} \to \Sigma(1900) \to \Lambda(1520)\pi$

MODULUS	PHASE (°)	DOCUMENT ID		TECN	COMMENT
0.04±0.02	**−25 ± 40**	SARANTSEV	19	DPWA	$\overline{K}N$ multichannel

Normalized residue in $N\overline{K} \to \Sigma(1900) \to \Delta\overline{K}$

MODULUS	PHASE (°)	DOCUMENT ID		TECN	COMMENT
0.11±0.04	**60 ± 30**	SARANTSEV	19	DPWA	$\overline{K}N$ multichannel

Normalized residue in $N\overline{K} \to \Sigma(1900) \to N\overline{K}^*(892)$, S=1/2, S-wave

MODULUS	*PHASE (°)*	*DOCUMENT ID*		*TECN*	*COMMENT*
0.17±0.06	**50 ± 50**	SARANTSEV	19	DPWA	$\overline{K}N$ multichannel

Normalized residue in $N\overline{K} \to \Sigma(1900) \to N\overline{K}^*(892)$, S=3/2, D-wave

MODULUS	*PHASE (°)*	*DOCUMENT ID*		*TECN*	*COMMENT*
0.05±0.04		SARANTSEV	19	DPWA	$\overline{K}N$ multichannel

$\Sigma(1900)$ MASS

VALUE (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
1900 to 1950 (≈ 1925) OUR ESTIMATE				
1938±12	SARANTSEV	19	DPWA	$\overline{K}N$ multichannel
1900±21	ZHANG	13A	DPWA	$\overline{K}N$ multichannel
1944±15	GOPAL	80	DPWA	$\overline{K}N \to \overline{K}N$
1755 or 1834	[1] MARTIN	77	DPWA	$\overline{K}N$ multichannel
2004±40	VANHORN	75	DPWA	$K^-p \to \Lambda\pi^0$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
1955±15	GOPAL	77	DPWA	$\overline{K}N$ multichannel

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

$\Sigma(1900)$ WIDTH

VALUE (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
140 to 190 (≈ 165) OUR ESTIMATE				
155±30	SARANTSEV	19	DPWA	$\overline{K}N$ multichannel
191±47	ZHANG	13A	DPWA	$\overline{K}N$ multichannel
215±25	GOPAL	80	DPWA	$\overline{K}N \to \overline{K}N$
413 or 450	[1] MARTIN	77	DPWA	$\overline{K}N$ multichannel
116±40	VANHORN	75	DPWA	$K^-p \to \Lambda\pi^0$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
170±40	GOPAL	77	DPWA	$\overline{K}N$ multichannel

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

$\Sigma(1900)$ DECAY MODES

	Mode	Fraction (Γ_i/Γ)
Γ_1	$N\overline{K}$	0.40 to 0.70 (≈ 0.55)
Γ_2	$\Sigma\pi$	0.10 to 0.40 (≈ 0.25)
Γ_3	$\Sigma\eta$	(1.0 ±1.0) %
Γ_4	$\Lambda\pi$	(6.0 ±2.0) %
Γ_5	ΞK	(3.0 ±2.0) %
Γ_6	$\Sigma(1385)\pi$	(7.0 ±3.0) %
Γ_7	$\Lambda(1520)\pi$	
Γ_8	$\Delta\overline{K}$	(2.5 ±1.0) %
Γ_9	$N\overline{K}^*(892)$, S=1/2 , S-wave	(7.0 ±3.0) %
Γ_{10}	$N\overline{K}^*(892)$, S=3/2 , D-wave	

$\Sigma(1900)$ BRANCHING RATIOS

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

VALUE	DOCUMENT ID		TECN	COMMENT
0.40 to 0.70 ($\approx$ 0.55) OUR ESTIMATE				
0.45 $\pm$ 0.09	SARANTSEV	19	DPWA	$\overline{K}N$ multichannel
0.67 $\pm$ 0.17	ZHANG	13A	DPWA	$\overline{K}N$ multichannel

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

VALUE	DOCUMENT ID		TECN	COMMENT
0.10 to 0.40 ($\approx$ 0.25) OUR ESTIMATE				
0.33 $\pm$ 0.07	SARANTSEV	19	DPWA	$\overline{K}N$ multichannel
0.10 $\pm$ 0.05	ZHANG	13A	DPWA	$\overline{K}N$ multichannel

$\Gamma(\Sigma\eta)/\Gamma_{\text{total}}$ Γ_3/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
0.01 $\pm$ 0.01	SARANTSEV	19	DPWA	$\overline{K}N$ multichannel

$\Gamma(\Lambda\pi)/\Gamma_{\text{total}}$ Γ_4/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
0.06 $\pm$ 0.02	SARANTSEV	19	DPWA	$\overline{K}N$ multichannel

$\Gamma(\Xi K)/\Gamma_{\text{total}}$ Γ_5/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
0.03 $\pm$ 0.02	SARANTSEV	19	DPWA	$\overline{K}N$ multichannel

$\Gamma(\Sigma(1385)\pi)/\Gamma_{\text{total}}$ Γ_6/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
0.07 $\pm$ 0.03	SARANTSEV	19	DPWA	$\overline{K}N$ multichannel

$\Gamma(\Lambda(1520)\pi)/\Gamma_{\text{total}}$ Γ_7/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
$<$0.01	SARANTSEV	19	DPWA	$\overline{K}N$ multichannel

$\Gamma(\Delta\overline{K})/\Gamma_{\text{total}}$ Γ_8/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
0.025 $\pm$ 0.010	SARANTSEV	19	DPWA	$\overline{K}N$ multichannel

$\Gamma(N\overline{K}^*(892), S{=}1/2, S\text{-wave})/\Gamma_{\text{total}}$ Γ_9/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
0.07 $\pm$ 0.03	SARANTSEV	19	DPWA	$\overline{K}N$ multichannel

$\Gamma(N\overline{K}^*(892), S{=}3/2, D\text{-wave})/\Gamma_{\text{total}}$ Γ_{10}/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
$<$0.01	SARANTSEV	19	DPWA	$\overline{K}N$ multichannel

Σ(1900) REFERENCES

SARANTSEV	19	EPJ A55 180	A.V. Sarantsev *et al.*	(BONN, PNPI)
ZHANG	13A	PR C88 035205	H. Zhang *et al.*	(KSU)
GOPAL	80	Toronto Conf. 159	G.P. Gopal	(RHEL)
GOPAL	77	NP B119 362	G.P. Gopal *et al.*	(LOIC, RHEL)
MARTIN	77	NP B127 349	B.R. Martin, M.K. Pidcock, R.G. Moorhouse	(LOUC+)
VANHORN	75	NP B87 145	A.J. van Horn	(LBL)