

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

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

OMITTED FROM SUMMARY TABLE

$\Sigma(1900)$ 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

$\Sigma(1900)$ POLE RESIDUES

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

<u>MODULUS</u>	<u>PHASE (°)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
0.17±0.06	50 ± 50	SARANTSEV	19	DPWA $\bar{K}N$ multichannel

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

<u>MODULUS</u>	<u>PHASE (°)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
0.05±0.04		SARANTSEV	19	DPWA $\bar{K}N$ multichannel

$\Sigma(1900)$ MASS

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

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

$\Sigma(1900)$ WIDTH

<u>VALUE (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
140 to 190 (≈ 165) OUR ESTIMATE			
155±30	SARANTSEV	19	DPWA $\bar{K}N$ multichannel
191±47	ZHANG	13A	DPWA $\bar{K}N$ multichannel
215±25	GOPAL	80	DPWA $\bar{K}N \rightarrow \bar{K}N$
413 or 450	¹ MARTIN	77	DPWA $\bar{K}N$ multichannel
116±40	VANHORN	75	DPWA $K^-p \rightarrow \Lambda\pi^0$
• • • We do not use the following data for averages, fits, limits, etc. • • •			
170±40	GOPAL	77	DPWA $\bar{K}N$ 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 $N\bar{K}$	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 $\Delta\bar{K}$	(2.5 ±1.0) %
Γ_9 $N\bar{K}^*(892)$, $S=1/2$, S -wave	(7.0 ±3.0) %
Γ_{10} $N\bar{K}^*(892)$, $S=3/2$, D -wave	

$\Sigma(1900)$ BRANCHING RATIOS

$\Gamma(N\bar{K})/\Gamma_{\text{total}}$				Γ_1/Γ
<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
0.40 to 0.70 (≈ 0.55) OUR ESTIMATE				
0.45 ± 0.09	SARANTSEV	19	DPWA	$\bar{K}N$ multichannel
0.67 ± 0.17	ZHANG	13A	DPWA	$\bar{K}N$ multichannel
$\Gamma(\Sigma\pi)/\Gamma_{\text{total}}$				Γ_2/Γ
<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
0.10 to 0.40 (≈ 0.25) OUR ESTIMATE				
0.33 ± 0.07	SARANTSEV	19	DPWA	$\bar{K}N$ multichannel
0.10 ± 0.05	ZHANG	13A	DPWA	$\bar{K}N$ multichannel
$\Gamma(\Sigma\eta)/\Gamma_{\text{total}}$				Γ_3/Γ
<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
0.01 $\pm$ 0.01	SARANTSEV	19	DPWA	$\bar{K}N$ multichannel
$\Gamma(\Lambda\pi)/\Gamma_{\text{total}}$				Γ_4/Γ
<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
0.06 $\pm$ 0.02	SARANTSEV	19	DPWA	$\bar{K}N$ multichannel
$\Gamma(\Xi K)/\Gamma_{\text{total}}$				Γ_5/Γ
<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
0.03 $\pm$ 0.02	SARANTSEV	19	DPWA	$\bar{K}N$ multichannel
$\Gamma(\Sigma(1385)\pi)/\Gamma_{\text{total}}$				Γ_6/Γ
<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
0.07 $\pm$ 0.03	SARANTSEV	19	DPWA	$\bar{K}N$ multichannel
$\Gamma(\Lambda(1520)\pi)/\Gamma_{\text{total}}$				Γ_7/Γ
<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
< 0.01	SARANTSEV	19	DPWA	$\bar{K}N$ multichannel
$\Gamma(\Delta\bar{K})/\Gamma_{\text{total}}$				Γ_8/Γ
<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
0.025 $\pm$ 0.010	SARANTSEV	19	DPWA	$\bar{K}N$ multichannel
$\Gamma(N\bar{K}^*(892), S=1/2, S\text{-wave})/\Gamma_{\text{total}}$				Γ_9/Γ
<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
0.07 $\pm$ 0.03	SARANTSEV	19	DPWA	$\bar{K}N$ multichannel
$\Gamma(N\bar{K}^*(892), S=3/2, D\text{-wave})/\Gamma_{\text{total}}$				Γ_{10}/Γ
<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
< 0.01	SARANTSEV	19	DPWA	$\bar{K}N$ multichannel

$\Sigma(1900)$ REFERENCES

SARANTSEV	19	EPJ A55 180	A.V. Sarantsev <i>et al.</i>	(BONN, PNPI)
ZHANG	13A	PR C88 035205	H. Zhang <i>et al.</i>	(KSU)
GOPAL	80	Toronto Conf. 159	G.P. Gopal	(RHEL)
GOPAL	77	NP B119 362	G.P. Gopal <i>et al.</i>	(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)
