

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

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

OMITTED FROM SUMMARY TABLE

$\Sigma(1900)$ POLE POSITION

REAL PART

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

−2×IMAGINARY PART

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

$\Sigma(1900)$ POLE RESIDUES

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

| MODULUS | PHASE (°) | DOCUMENT ID | TECN | COMMENT |
|------------------|----------------|--------------|------|-------------------------|
| 0.11±0.04 | 60 ± 30 | SARANTSEV 19 | DPWA | $\bar{K}N$ 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 ($^\circ$)</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 ($^\circ$)</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 (\approx 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 (\approx 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**

| | <u>Mode</u> | <u>Fraction (Γ_i/Γ)</u> |
|---------------|---|--|
| Γ_1 | $N\bar{K}$ | 0.40 to 0.70 (\approx 0.55) |
| Γ_2 | $\Sigma\pi$ | 0.10 to 0.40 (\approx 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 \pm 0.09 | SARANTSEV 19 | DPWA | $\bar{K}N$ multichannel |
| 0.67 \pm 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 \pm 0.07 | SARANTSEV 19 | DPWA | $\bar{K}N$ multichannel |
| 0.10 \pm 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\pm0.01 | 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\pm0.02 | 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\pm0.02 | 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\pm0.03 | 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\pm0.010 | 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\pm0.03 | 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) |

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|---------|----|-------------|---|--------------|
| 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) |
