$N(1895)\ 1/2^-$

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

OMITTED FROM SUMMARY TABLE

Before our 2012 *Review*, this state appeared in our Listings as the $N(2090)$. Any structure in the S_{11} wave above 1800 MeV is listed here. A few early results that are now obsolete have been omitted.

N(1895) POLE POSITION

REAL PART

VALUE (MeV)	DOCUMENT ID		TECN	COMMENT
1907±10	SOKHOYAN	15A	DPWA	Multichannel
1917±19±1	[1] SVARC	14	L+P	$\pi N \to \pi N$
2150±70	CUTKOSKY	80	IPWA	$\pi N \to \pi N$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
1900±15	ANISOVICH	12A	DPWA	Multichannel
1858	SHRESTHA	12A	DPWA	Multichannel
1797±26	BATINIC	10	DPWA	$\pi N \to N\pi,\ N\eta$
1795	VRANA	00	DPWA	Multichannel

−2×IMAGINARY PART

VALUE (MeV)	DOCUMENT ID		TECN	COMMENT
$100^{+\ 40}_{-\ 15}$	SOKHOYAN	15A	DPWA	Multichannel
101± 36±1	[1] SVARC	14	L+P	$\pi N \to \pi N$
350±100	CUTKOSKY	80	IPWA	$\pi N \to \pi N$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$90^{+\ 30}_{-\ 15}$	ANISOVICH	12A	DPWA	Multichannel
479	SHRESTHA	12A	DPWA	Multichannel
420± 45	BATINIC	10	DPWA	$\pi N \to N\pi,\ N\eta$
220	VRANA	00	DPWA	Multichannel

N(1895) ELASTIC POLE RESIDUE

MODULUS |r|

VALUE (MeV)	DOCUMENT ID		TECN	COMMENT
3 ± 2	SOKHOYAN	15A	DPWA	Multichannel
3.1± 1.4	[1] SVARC	14	L+P	$\pi N \to \pi N$
40 ±20	CUTKOSKY	80	IPWA	$\pi N \to \pi N$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
1 ± 1	ANISOVICH	12A	DPWA	Multichannel
60	BATINIC	10	DPWA	$\pi N \to N\pi,\ N\eta$

PHASE θ

VALUE (°)	DOCUMENT ID		TECN	COMMENT
125±45	SOKHOYAN	15A	DPWA	Multichannel
−107±23±2	[1] SVARC	14	L+P	$\pi N \rightarrow \pi N$
0±90	CUTKOSKY	80	IPWA	$\pi N \rightarrow \pi N$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
−164	BATINIC	10	DPWA	$\pi N \rightarrow N\pi, N\eta$

N(1895) INELASTIC POLE RESIDUE

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

Normalized residue in $N\pi \rightarrow N(1895) \rightarrow N\eta$

MODULUS	PHASE (°)	DOCUMENT ID		TECN	COMMENT
0.06±0.02	40 ± 20	ANISOVICH	12A	DPWA	Multichannel

Normalized residue in $N\pi \rightarrow N(1895) \rightarrow \Lambda K$

MODULUS	PHASE (°)	DOCUMENT ID		TECN	COMMENT
0.05±0.02	−90 ± 30	ANISOVICH	12A	DPWA	Multichannel

Normalized residue in $N\pi \rightarrow N(1895) \rightarrow \Sigma K$

MODULUS	PHASE (°)	DOCUMENT ID		TECN	COMMENT
0.06±0.02	40 ± 30	ANISOVICH	12A	DPWA	Multichannel

Normalized residue in $N\pi \rightarrow N(1895) \rightarrow \Delta(1232)\pi$

MODULUS	PHASE (°)	DOCUMENT ID		TECN	COMMENT
0.05±0.025	−100 ± 45	SOKHOYAN	15A	DPWA	Multichannel

Normalized residue in $N\pi \rightarrow N(1895) \rightarrow N(1440)\pi$

MODULUS	PHASE (°)	DOCUMENT ID		TECN	COMMENT
0.05±0.025	−100 ± 45	SOKHOYAN	15A	DPWA	Multichannel

N(1895) BREIT-WIGNER MASS

VALUE (MeV)	DOCUMENT ID		TECN	COMMENT
1905±12	SOKHOYAN	15A	DPWA	Multichannel
2180±80	CUTKOSKY	80	IPWA	$\pi N \rightarrow \pi N$
1880±20	HOEHLER	79	IPWA	$\pi N \rightarrow \pi N$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
1895±15	ANISOVICH	12A	DPWA	Multichannel
1910±15	SHRESTHA	12A	DPWA	Multichannel
1812±25	BATINIC	10	DPWA	$\pi N \rightarrow N\pi, N\eta$
1822±43	VRANA	00	DPWA	Multichannel

N(1895) BREIT-WIGNER WIDTH

VALUE (MeV)	DOCUMENT ID		TECN	COMMENT
100^{+30}_{-10}	SOKHOYAN	15A	DPWA	Multichannel
350±100	CUTKOSKY	80	IPWA	$\pi N \rightarrow \pi N$
95± 30	HOEHLER	79	IPWA	$\pi N \rightarrow \pi N$

• • • We do not use the following data for averages, fits, limits, etc. • • •

$90^{+\ 30}_{-\ 15}$	ANISOVICH	12A	DPWA	Multichannel
502± 47	SHRESTHA	12A	DPWA	Multichannel
405± 40	BATINIC	10	DPWA	$\pi N \to N\pi$, $N\eta$
248±185	VRANA	00	DPWA	Multichannel

$N(1895)$ DECAY MODES

	Mode	Fraction (Γ_i/Γ)
Γ_1	$N\pi$	1–4 %
Γ_2	$N\eta$	15–27 %
Γ_3	$N\omega$	
Γ_4	ΛK	13–23 %
Γ_5	ΣK	6–20 %
Γ_6	$N\pi\pi$	
Γ_7	$\Delta(1232)\pi$	
Γ_8	$\Delta(1232)\pi$, D-wave	3–11 %
Γ_9	$N\rho$	
Γ_{10}	$N\rho$, S=1/2, S-wave	seen
Γ_{11}	$N\rho$, S=3/2, D-wave	seen
Γ_{12}	$N\sigma$	seen
Γ_{13}	$N(1440)\pi$	1–4 %
Γ_{14}	$p\gamma$, helicity=1/2	0.01–0.06 %
Γ_{15}	$n\gamma$, helicity=1/2	0.003–0.05 %

$N(1895)$ BRANCHING RATIOS

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

VALUE (%)	DOCUMENT ID		TECN	COMMENT
2.5±1.5	SOKHOYAN	15A	DPWA	Multichannel
18 ±8	CUTKOSKY	80	IPWA	$\pi N \to \pi N$
9 ±5	HOEHLER	79	IPWA	$\pi N \to \pi N$

• • • We do not use the following data for averages, fits, limits, etc. • • •

2 ±1	ANISOVICH	12A	DPWA	Multichannel
17 ±2	SHRESTHA	12A	DPWA	Multichannel
32 ±6	BATINIC	10	DPWA	$\pi N \to N\pi$, $N\eta$
17 ±3	VRANA	00	DPWA	Multichannel

$\Gamma(N\eta)/\Gamma_{\text{total}}$ Γ_2/Γ

VALUE (%)	DOCUMENT ID		TECN	COMMENT
21± 6	ANISOVICH	12A	DPWA	Multichannel

• • • We do not use the following data for averages, fits, limits, etc. • • •

40± 4	SHRESTHA	12A	DPWA	Multichannel
22±10	BATINIC	10	DPWA	$\pi N \to N\pi$, $N\eta$
41± 4	VRANA	00	DPWA	Multichannel

$\Gamma(N\omega)/\Gamma_{total}$ Γ_3/Γ

VALUE (%)	DOCUMENT ID		TECN	COMMENT
28 ± 12	DENISENKO	16	DPWA	Multichannel

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

VALUE (%)	DOCUMENT ID		TECN	COMMENT
18 ±5	ANISOVICH	12A	DPWA	Multichannel
• • • We do not use the following data for averages, fits, limits, etc. • • •				
1.8 ± 0.8	SHRESTHA	12A	DPWA	Multichannel

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

VALUE (%)	DOCUMENT ID		TECN	COMMENT
13 ± 7	ANISOVICH	12A	DPWA	Multichannel

$\Gamma(\Delta(1232)\pi$, D-wave$)/\Gamma_{total}$ Γ_8/Γ

VALUE (%)	DOCUMENT ID		TECN	COMMENT
7 ± 4	SOKHOYAN	15A	DPWA	Multichannel
• • • We do not use the following data for averages, fits, limits, etc. • • •				
7 ± 3	SHRESTHA	12A	DPWA	Multichannel
1 ± 1	VRANA	00	DPWA	Multichannel

$\Gamma(N\rho$, S=1/2, S-wave$)/\Gamma_{total}$ Γ_{10}/Γ

VALUE (%)	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
< 2	SHRESTHA	12A	DPWA	Multichannel
36 ± 1	VRANA	00	DPWA	Multichannel

$\Gamma(N\rho$, S=3/2, D-wave$)/\Gamma_{total}$ Γ_{11}/Γ

VALUE (%)	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
9 ± 3	SHRESTHA	12A	DPWA	Multichannel
1 ± 1	VRANA	00	DPWA	Multichannel

$\Gamma(N\sigma)/\Gamma_{total}$ Γ_{12}/Γ

VALUE (%)	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
<2	SHRESTHA	12A	DPWA	Multichannel
2 ± 1	VRANA	00	DPWA	Multichannel

$\Gamma(N(1440)\pi)/\Gamma_{total}$ Γ_{13}/Γ

VALUE (%)	DOCUMENT ID		TECN	COMMENT
2.5 ± 1.5	SOKHOYAN	15A	DPWA	Multichannel
• • • We do not use the following data for averages, fits, limits, etc. • • •				
24 ±4	SHRESTHA	12A	DPWA	Multichannel
2 ±1	VRANA	00	DPWA	Multichannel

N(1895) PHOTON DECAY AMPLITUDES AT THE POLE

N(1895) → *pγ*, helicity-1/2 amplitude $A_{1/2}$

MODULUS ($GeV^{-1/2}$)	*PHASE* (°)	*DOCUMENT ID*		*TECN*	*COMMENT*
0.015±0.006	145 ± 35	SOKHOYAN	15A	DPWA	Multichannel

N(1895) BREIT-WIGNER PHOTON DECAY AMPLITUDES

N(1895) → *pγ*, helicity-1/2 amplitude $A_{1/2}$

VALUE ($GeV^{-1/2}$)	*DOCUMENT ID*		*TECN*	*COMMENT*
−0.016±0.006	SOKHOYAN	15A	DPWA	Multichannel
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.012±0.006	SHRESTHA	12A	DPWA	Multichannel

N(1895) → *nγ*, helicity-1/2 amplitude $A_{1/2}$

VALUE ($GeV^{-1/2}$)	*DOCUMENT ID*		*TECN*	*COMMENT*
0.013±0.006	ANISOVICH	13B	DPWA	Multichannel
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.003±0.007	SHRESTHA	12A	DPWA	Multichannel

N(1895) FOOTNOTES

[1] Fit to the amplitudes of HOEHLER 79.

N(1895) REFERENCES

DENISENKO	16	PL B755 97	I. Denisenko *et al.*	
SOKHOYAN	15A	EPJ A51 95	V. Sokhoyan *et al.*	(CBELSA/TAPS Collab.)
SVARC	14	PR C89 045205	A. Svarc *et al.*	
ANISOVICH	13B	EPJ A49 67	A.V. Anisovich *et al.*	
ANISOVICH	12A	EPJ A48 15	A.V. Anisovich *et al.*	(BONN, PNPI)
SHRESTHA	12A	PR C86 055203	M. Shrestha, D.M. Manley	(KSU)
BATINIC	10	PR C82 038203	M. Batinic *et al.*	(ZAGR)
VRANA	00	PRPL 328 181	T.P. Vrana, S.A. Dytman, T.-S.H. Lee	(PITT, ANL)
CUTKOSKY	80	Toronto Conf. 19	R.E. Cutkosky *et al.*	(CMU, LBL) IJP
Also		PR D20 2839	R.E. Cutkosky *et al.*	(CMU, LBL)
HOEHLER	79	PDAT 12-1	G. Hohler *et al.*	(KARLT) IJP
Also		Toronto Conf. 3	R. Koch	(KARLT) IJP