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

$I(J^P) = \frac{1}{2}(\frac{1}{2}^-)$ 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.

The latest GWU analysis (ARNDT 06) finds no evidence for this resonance.

$N(1895)$ BREIT-WIGNER MASS

VALUE (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
≈ 2090 OUR ESTIMATE				
1895 ± 15	ANISOVICH	12A	DPWA	Multichannel
1928 ± 59	MANLEY	92	IPWA	$\pi N \to \pi N$ & $N \pi\pi$
2180 ± 80	CUTKOSKY	80	IPWA	$\pi N \to \pi N$
1880 ± 20	HOEHLER	79	IPWA	$\pi N \to \pi N$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
1812 ± 25	BATINIC	10	DPWA	$\pi N \to N\pi$, $N\eta$
1822 ± 43	VRANA	00	DPWA	Multichannel
$1897 \pm 50 {}^{+30}_{-\ 2}$	PLOETZKE	98	SPEC	$\gamma p \to p\eta'(958)$

$N(1895)$ BREIT-WIGNER WIDTH

VALUE (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
$90 {}^{+30}_{-15}$	ANISOVICH	12A	DPWA	Multichannel
414 ± 157	MANLEY	92	IPWA	$\pi N \to \pi N$ & $N \pi\pi$
350 ± 100	CUTKOSKY	80	IPWA	$\pi N \to \pi N$
95 ± 30	HOEHLER	79	IPWA	$\pi N \to \pi N$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
405 ± 40	BATINIC	10	DPWA	$\pi N \to N\pi$, $N\eta$
248 ± 185	VRANA	00	DPWA	Multichannel
$396 \pm 155 {}^{+35}_{-45}$	PLOETZKE	98	SPEC	$\gamma p \to p\eta'(958)$

$N(1895)$ POLE POSITION

REAL PART

VALUE (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
1900 ± 15	ANISOVICH	12A	DPWA	Multichannel
2150 ± 70	CUTKOSKY	80	IPWA	$\pi N \to \pi N$
1937 or 1949	[1] LONGACRE	78	IPWA	$\pi N \to N\pi\pi$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
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*
90^{+30}_{-15}	ANISOVICH	12A	DPWA	Multichannel
350±100	CUTKOSKY	80	IPWA	$\pi N \rightarrow \pi N$
139 or 131	[1] LONGACRE	78	IPWA	$\pi N \rightarrow N \pi \pi$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
420± 45	BATINIC	10	DPWA	$\pi N \rightarrow N \pi$, $N \eta$
220	VRANA	00	DPWA	Multichannel

N(1895) ELASTIC POLE RESIDUE

MODULUS |*r*|

VALUE (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
1± 1	ANISOVICH	12A	DPWA	Multichannel
40±20	CUTKOSKY	80	IPWA	$\pi N \rightarrow \pi N$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
60	BATINIC	10	DPWA	$\pi N \rightarrow N \pi$, $N \eta$

PHASE θ

VALUE (°)	*DOCUMENT ID*		*TECN*	*COMMENT*
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 Γ_{pole}.

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

MODULUS (%)	*PHASE (°)*	*DOCUMENT ID*		*TECN*	*COMMENT*
6±2	40 ± 20	ANISOVICH	12A	DPWA	Multichannel

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

MODULUS (%)	*PHASE (°)*	*DOCUMENT ID*		*TECN*	*COMMENT*
5±2	−90 ± 30	ANISOVICH	12A	DPWA	Multichannel

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

MODULUS (%)	*PHASE (°)*	*DOCUMENT ID*		*TECN*	*COMMENT*
6±2	40 ± 30	ANISOVICH	12A	DPWA	Multichannel

$N(1895)$ DECAY MODES

	Mode
Γ_1	$N\pi$
Γ_2	$N\eta$
Γ_3	ΛK
Γ_4	ΣK
Γ_5	$N\pi\pi$
Γ_6	$\Delta\pi$
Γ_7	$\Delta(1232)\pi$, D-wave
Γ_8	$N\rho$
Γ_9	$N\rho$, S=1/2, S-wave
Γ_{10}	$N\rho$, S=3/2, D-wave
Γ_{11}	$N(\pi\pi)^{I=0}_{S\text{-wave}}$
Γ_{12}	$N(1440)\pi$

$N(1895)$ BRANCHING RATIOS

$\Gamma(N\pi)/\Gamma_{total}$ — Γ_1/Γ

VALUE (%)	DOCUMENT ID		TECN	COMMENT
2± 1	ANISOVICH	12A	DPWA	Multichannel
10±10	MANLEY	92	IPWA	$\pi N \rightarrow \pi N$ & $N\pi\pi$
18± 8	CUTKOSKY	80	IPWA	$\pi N \rightarrow \pi N$
9± 5	HOEHLER	79	IPWA	$\pi N \rightarrow \pi N$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
32± 6	BATINIC	10	DPWA	$\pi N \rightarrow N\pi$, $N\eta$
17± 3	VRANA	00	DPWA	Multichannel

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

VALUE (%)	DOCUMENT ID		TECN	COMMENT
21± 6	ANISOVICH	12A	DPWA	Multichannel
41± 4	VRANA	00	DPWA	Multichannel
• • • We do not use the following data for averages, fits, limits, etc. • • •				
22±10	BATINIC	10	DPWA	$\pi N \rightarrow N\pi$, $N\eta$

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

VALUE (%)	DOCUMENT ID		TECN	COMMENT
18±5	ANISOVICH	12A	DPWA	Multichannel

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

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

$(\Gamma_i\Gamma_f)^{1/2}/\Gamma_{total}$ in $N\pi \rightarrow N(1895) \rightarrow \Lambda K$ — $(\Gamma_1\Gamma_3)^{1/2}/\Gamma$

VALUE	DOCUMENT ID		TECN	COMMENT
not seen	SAXON	80	DPWA	$\pi^- p \rightarrow \Lambda K^0$

$\Gamma(\Delta(1232)\pi$, D-wave$)/\Gamma_{total}$ — Γ_7/Γ

VALUE (%)	DOCUMENT ID		TECN	COMMENT
1±1	VRANA	00	DPWA	Multichannel

$\Gamma(N\rho$, S=1/2, S-wave$)/\Gamma_{total}$ — Γ_9/Γ

VALUE (%)	DOCUMENT ID		TECN	COMMENT
36±1	VRANA	00	DPWA	Multichannel

$\Gamma(N\rho$, S=3/2, D-wave$)/\Gamma_{total}$ — Γ_{10}/Γ

VALUE (%)	DOCUMENT ID		TECN	COMMENT
1±1	VRANA	00	DPWA	Multichannel

$\Gamma(N(\pi\pi)^{I=0}_{S\text{-wave}})/\Gamma_{total}$ — Γ_{11}/Γ

VALUE (%)	DOCUMENT ID		TECN	COMMENT
2±1	VRANA	00	DPWA	Multichannel

$\Gamma(N(1440)\pi)/\Gamma_{total}$ — Γ_{12}/Γ

VALUE (%)	DOCUMENT ID		TECN	COMMENT
2±1	VRANA	00	DPWA	Multichannel

N(1895) PHOTON DECAY AMPLITUDES

$N(1895) \rightarrow p\gamma$, helicity-1/2 amplitude $A_{1/2}$

VALUE	DOCUMENT ID		TECN	COMMENT
0.012±0.006	[2] ANISOVICH	12A	DPWA	Phase = (120 ± 50)°

N(1895) FOOTNOTES

[1] LONGACRE 78 values are from a search for poles in the unitarized T-matrix. The first (second) value uses, in addition to $\pi N \rightarrow N\pi\pi$ data, elastic amplitudes from a Saclay (CERN) partial-wave analysis.

[2] This ANISOVICH 12A value is the complex helicity amplitude at the pole position.

N(1895) REFERENCES

ANISOVICH	12A	EPJ A48 15	A.V. Anisovich *et al.*	(BONN, PNPI)
BATINIC	10	PR C82 038203	M. Batinic *et al.*	(ZAGR)
ARNDT	06	PR C74 045205	R.A. Arndt *et al.*	(GWU)
VRANA	00	PRPL 328 181	T.P. Vrana, S.A. Dytman,, T.-S.H. Lee	(PITT+)
PLOETZKE	98	PL B444 555	R. Ploetzke *et al.*	(Bonn SAPHIR Collab.)
MANLEY	92	PR D45 4002	D.M. Manley, E.M. Saleski	(KENT) IJP
Also		PR D30 904	D.M. Manley *et al.*	(VPI)
CUTKOSKY	80	Toronto Conf. 19	R.E. Cutkosky *et al.*	(CMU, LBL) IJP
Also		PR D20 2839	R.E. Cutkosky *et al.*	(CMU, LBL)
SAXON	80	NP B162 522	D.H. Saxon *et al.*	(RHEL, BRIS) IJP
HOEHLER	79	PDAT 12-1	G. Hohler *et al.*	(KARLT) IJP
Also		Toronto Conf. 3	R. Koch	(KARLT) IJP
LONGACRE	78	PR D17 1795	R.S. Longacre *et al.*	(LBL, SLAC)