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

RFAI	PART

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

-2×IMAGINARY PART VALUE (MeV)	DOCUMENT ID		TECN	COMMENT
100 ⁺ 40 - 15	SOKHOYAN	15A	DPWA	Multichannel
$101 \pm \ 36 \pm 1$	¹ SVARC	14	L + P	$\pi N \rightarrow \pi N$
350 ± 100	CUTKOSKY	80	IPWA	$\pi N \rightarrow \pi N$
• • • We do not use the follow	ving data for averages	s, fits,	limits, e	etc. • • •
90 ⁺ 30 - 15	ANISOVICH	12A	DPWA	Multichannel
479	SHRESTHA	12A	DPWA	Multichannel
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
3 ± 2	SOKHOYAN	15A	DPWA	Multichannel
$3.1\pm~1.4$	¹ SVARC	14	L+P	$\pi N \rightarrow \pi N$
40 ±20	CUTKOSKY	80	IPWA	$\pi N \rightarrow \pi N$
• • • We do not use the following	ng data for averages	s, fits,	limits, e	etc. • • •
1 ± 1	ANISOVICH	12A	DPWA	Multichannel
60	BATINIC	10	DPWA	$\pi N \rightarrow N\pi, N\eta$

PHASE θ

VALUE (°)	DOCUMENT ID		TECN	COMMENT
$125\!\pm\!45$	SOKHOYAN	15A	DPWA	Multichannel
$-107 \pm 23 \pm 2$	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	s, fits,	limits, e	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	$V\pi ightarrow N(1895$	$) \rightarrow N\eta$
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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 1	.2a DPWA	Multichannel

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

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

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

MODULUS	PHASE (°)	DOCUMENT ID	TECN	COMMENT
$0.05\!\pm\!0.025$	-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 of	data for averages	s, fits,	limits, e	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	$\pi N \rightarrow \pi N$
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ullet ullet We do not use the following data for averages, fits, limits, etc. ullet ullet

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

N(1895) DECAY MODES

	Mode	Fraction (Γ_i/Γ)
$\overline{\Gamma_1}$	$N\pi$	1–4 %
Γ_2	$N\eta$	15–27 %
Γ ₃	N ω	
Γ_4	ΛK	13–23 %
Γ_5	ΣK	6–20 %
Γ_6	$N\pi\pi$	
Γ_7	$\Delta(1232)\pi$	
Γ ₈	$arDelta(1232)\pi$, $ extit{D}\! ext{-}\! ext{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

$\Gamma(N\pi)/\Gamma_{\text{total}}$	DOCUMENT ID		TECN	COMMENT	Γ_1/Γ
VALUE (%)	DOCUMENT ID		TECN	COMMENT	
2.5 ± 1.5	SOKHOYAN	15A	DPWA	Multichannel	
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 of	data for average	s, fits,	limits, e	etc. • • •	
2 ±1	ANISOVICH	12A	DPWA	Multichannel	
17 ± 2	SHRESTHA	12A	DPWA	Multichannel	
32 ±6	BATINIC	10	DPWA	$\pi N \rightarrow N\pi, N\eta$	
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 of	data for average	s, fits,	limits, e	etc. • • •	
40± 4	SHRESTHA	12A	DPWA	Multichannel	
22 ± 10	BATINIC	10	DPWA	$\pi N \rightarrow N\pi, N\eta$	
41± 4	VRANA	00	DPWA	Multichannel	

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$\Gamma(N\omega)/\Gamma_{total}$					Γ_3/Γ
VALUE (%)	DOCUMENT ID		TECN	COMMENT	
28±12	DENISENKO	16	DPWA	Multichannel	
$\Gamma(\Lambda K)/\Gamma_{\text{total}}$					Γ_4/Γ
VALUE (%)	DOCUMENT ID		TECN	COMMENT	7/
18 ±5	ANISOVICH	12A	DPWA	Multichannel	
• • • We do not use the following of	lata for averages	, fits,	limits, e	tc. • • •	
1.8 ± 0.8	SHRESTHA	12A	DPWA	Multichannel	
F(FV) / F					F /F
$\Gamma(\Sigma K)/\Gamma_{\text{total}}$	DOCUMENT ID		TECN	COMMENT	Γ_5/Γ
VALUE (%)	DOCUMENT ID	104	TECN	COMMENT	
13±7	ANISOVICH	12A	DPWA	Multichannel	
Γ (Δ(1232) π , <i>D</i> -wave)/ Γ _{total}					Γ_8/Γ
VALUE (%)	DOCUMENT ID		TECN	COMMENT	
7 ± 4	SOKHOYAN	15A	DPWA	Multichannel	
• • • We do not use the following of	lata for averages	, fits,	limits, e	tc. • • •	
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	- 10/ -
• • • We do not use the following of	lata for averages	, fits,	limits, e	tc. • • •	
• • • We do not use the following of the contract of the contr	_				
$ullet$ $ullet$ We do not use the following c < 2 $36 \!\pm\! 1$	lata for averages SHRESTHA VRANA		DPWA	tc. • • • Multichannel Multichannel	
< 2 36±1	SHRESTHA	12A	DPWA	Multichannel	F., /F
$< 2 \atop 36\pm 1$ $\Gamma(N ho$, S=3/2, <i>D</i> -wave)/ $\Gamma_{ ext{total}}$	SHRESTHA VRANA	12A	DPWA DPWA	Multichannel Multichannel	Г ₁₁ /Г
< 2 36 ± 1 $\Gamma(N\rho, S=3/2, D\text{-wave})/\Gamma_{total}$ VALUE (%)	SHRESTHA VRANA	12A 00	DPWA DPWA	Multichannel Multichannel	Г ₁₁ /Г
< 2 36 ± 1 $\Gamma(N\rho, S=3/2, D\text{-wave})/\Gamma_{\text{total}}$ $VALUE (\%)$ • • • We do not use the following of	SHRESTHA VRANA DOCUMENT ID lata for averages	12A 00 s, fits,	DPWA DPWA TECN limits, e	Multichannel Multichannel COMMENT tc. • • •	Γ ₁₁ /Γ
< 2 36 ± 1 $\Gamma(N\rho, S=3/2, D\text{-wave})/\Gamma_{\text{total}}$ $\frac{VALUE\ (\%)}{\bullet \bullet \bullet \text{ We do not use the following of }9\pm3$	SHRESTHA VRANA DOCUMENT ID lata for averages SHRESTHA	12A 00 s, fits, 12A	DPWA DPWA TECN limits, e	Multichannel Multichannel COMMENT tc. • • • Multichannel	Γ ₁₁ /Γ
< 2 36 ± 1 $\Gamma(N\rho, S=3/2, D\text{-wave})/\Gamma_{\text{total}}$ $VALUE (\%)$ • • • We do not use the following of 9 ± 3 1 ± 1	SHRESTHA VRANA DOCUMENT ID lata for averages	12A 00 s, fits,	DPWA DPWA TECN limits, e	Multichannel Multichannel COMMENT tc. • • •	Γ ₁₁ /Γ
< 2 36 ± 1 $\Gamma(N\rho, S=3/2, D\text{-wave})/\Gamma_{\text{total}}$ $VALUE (\%)$ • • • We do not use the following of 9 ± 3 1 ± 1	SHRESTHA VRANA DOCUMENT ID lata for averages SHRESTHA	12A 00 s, fits, 12A	DPWA DPWA TECN limits, e	Multichannel Multichannel COMMENT tc. • • • Multichannel	Γ ₁₁ /Γ
< 2 36 ± 1 $\Gamma(N\rho, S=3/2, D\text{-wave})/\Gamma_{\text{total}}$ $\frac{VALUE\ (\%)}{\bullet \bullet \bullet \text{ We do not use the following of }9\pm3$	SHRESTHA VRANA DOCUMENT ID lata for averages SHRESTHA	12A 00 s, fits, 12A	DPWA DPWA TECN limits, e	Multichannel Multichannel COMMENT tc. • • • Multichannel	
< 2 36 ± 1 $\Gamma(N\rho, S=3/2, D\text{-wave})/\Gamma_{\text{total}}$ $\frac{VALUE\ (\%)}{\bullet \bullet \bullet}$ We do not use the following of 9 ± 3 1 ± 1 $\Gamma(N\sigma)/\Gamma_{\text{total}}$	SHRESTHA VRANA DOCUMENT ID data for averages SHRESTHA VRANA	12A 00 s, fits, 12A 00	DPWA DPWA TECN DPWA DPWA	Multichannel Multichannel COMMENT tc. • • • Multichannel Multichannel	
< 2 36 ± 1 $\Gamma(N\rho, S=3/2, D\text{-wave})/\Gamma_{\text{total}}$ $\frac{VALUE\ (\%)}{\bullet \bullet \bullet}$ • • We do not use the following of 9 ± 3 1 ± 1 $\Gamma(N\sigma)/\Gamma_{\text{total}}$ $\frac{VALUE\ (\%)}{VALUE\ (\%)}$	SHRESTHA VRANA DOCUMENT ID data for averages SHRESTHA VRANA	12A 00 s, fits, 12A 00	DPWA DPWA TECN limits, e DPWA DPWA TECN limits, e	Multichannel Multichannel COMMENT tc. • • • Multichannel Multichannel	
< 2 36 ± 1 $\Gamma(N\rho, S=3/2, D\text{-wave})/\Gamma_{\text{total}}$ $VALUE (\%)$ • • • We do not use the following of 9 ± 3 1 ± 1 $\Gamma(N\sigma)/\Gamma_{\text{total}}$ $VALUE (\%)$ • • • We do not use the following of 9 ± 3	SHRESTHA VRANA DOCUMENT ID lata for averages SHRESTHA VRANA DOCUMENT ID lata for averages	12A 00 s, fits, 12A 00	DPWA DPWA TECN DPWA DPWA TECN limits, e DPWA	Multichannel Multichannel COMMENT tc. • • • Multichannel Multichannel COMMENT tc. • • •	
< 2 36 ± 1 $\Gamma(N\rho, S=3/2, D\text{-wave})/\Gamma_{\text{total}}$ $VALUE (\%)$ • • • We do not use the following of 9 ± 3 1 ± 1 $\Gamma(N\sigma)/\Gamma_{\text{total}}$ $VALUE (\%)$ • • • We do not use the following of 2 2 2 ± 1	SHRESTHA VRANA DOCUMENT ID data for averages SHRESTHA VRANA DOCUMENT ID data for averages SHRESTHA	12A 00 s, fits, 12A 00 s, fits, 12A	DPWA DPWA TECN DPWA DPWA TECN limits, e DPWA	Multichannel COMMENT tc. • • • Multichannel Multichannel COMMENT tc. • • • Multichannel	Γ ₁₂ /Γ
	SHRESTHA VRANA DOCUMENT ID data for averages SHRESTHA VRANA DOCUMENT ID data for averages SHRESTHA VRANA	12A 00 s, fits, 12A 00 s, fits, 12A	DPWA DPWA TECN limits, e DPWA DPWA TECN limits, e DPWA DPWA	Multichannel Multichannel COMMENT tc. • • • Multichannel Multichannel COMMENT tc. • • • Multichannel Multichannel	
< 2 36 ± 1 $\Gamma(N\rho, S=3/2, D\text{-wave})/\Gamma_{\text{total}}$ $VALUE(\%)$ • • • We do not use the following of 9 ± 3 1 ± 1 $\Gamma(N\sigma)/\Gamma_{\text{total}}$ $VALUE(\%)$ • • • We do not use the following of (2π)	SHRESTHA VRANA DOCUMENT ID data for averages SHRESTHA VRANA DOCUMENT ID data for averages SHRESTHA VRANA DOCUMENT ID data for averages SHRESTHA VRANA	12A 00 s, fits, 12A 00 s, fits, 12A 00	DPWA DPWA TECN limits, e DPWA DPWA TECN limits, e DPWA TECN	Multichannel Multichannel COMMENT tc. • • • Multichannel Multichannel COMMENT tc. • • Multichannel Multichannel	Γ ₁₂ /Γ
< 2 36 ± 1 $\Gamma(N\rho, S=3/2, D\text{-wave})/\Gamma_{\text{total}}$ $VALUE$ (%) • • • We do not use the following of 9 ± 3 1 ± 1 $\Gamma(N\sigma)/\Gamma_{\text{total}}$ $VALUE$ (%) • • • We do not use the following of <2 2 ± 1 $\Gamma(N(1440)\pi)/\Gamma_{\text{total}}$ $VALUE$ (%) 2.5 ±1.5	SHRESTHA VRANA DOCUMENT ID data for averages SHRESTHA VRANA DOCUMENT ID data for averages SHRESTHA VRANA DOCUMENT ID SOKHOYAN	12A 00 s, fits, 12A 00 s, fits, 12A 00	DPWA DPWA TECN limits, e DPWA DPWA TECN limits, e DPWA TECN DPWA	Multichannel Multichannel COMMENT tc. • • • Multichannel Multichannel COMMENT tc. • • • Multichannel Multichannel Multichannel Multichannel	Γ ₁₂ /Γ
< 2 36 ± 1 $\Gamma(N\rho, S=3/2, D\text{-wave})/\Gamma_{\text{total}}$ $VALUE(\%)$ • • • We do not use the following of 9 ± 3 1 ± 1 $\Gamma(N\sigma)/\Gamma_{\text{total}}$ $VALUE(\%)$ • • • We do not use the following of <2 2 ± 1 $\Gamma(N(1440)\pi)/\Gamma_{\text{total}}$ $VALUE(\%)$ 2.5 ± 1.5 • • • We do not use the following of <2	SHRESTHA VRANA DOCUMENT ID data for averages SHRESTHA VRANA DOCUMENT ID data for averages SHRESTHA VRANA DOCUMENT ID SOKHOYAN data for averages	12A 00 s, fits, 12A 00 s, fits, 12A 00	DPWA DPWA TECN limits, e DPWA DPWA TECN limits, e DPWA DPWA	Multichannel COMMENT tc. • • • Multichannel Multichannel Multichannel Multichannel Multichannel Multichannel Multichannel Multichannel Multichannel	Γ ₁₂ /Γ
< 2 36 ± 1 $\Gamma(N\rho, S=3/2, D\text{-wave})/\Gamma_{\text{total}}$ $VALUE$ (%) • • • We do not use the following of 9 ± 3 1 ± 1 $\Gamma(N\sigma)/\Gamma_{\text{total}}$ $VALUE$ (%) • • • We do not use the following of <2 2 ± 1 $\Gamma(N(1440)\pi)/\Gamma_{\text{total}}$ $VALUE$ (%) 2.5 ±1.5	SHRESTHA VRANA DOCUMENT ID data for averages SHRESTHA VRANA DOCUMENT ID data for averages SHRESTHA VRANA DOCUMENT ID SOKHOYAN	12A 00 s, fits, 12A 00 s, fits, 12A 00	DPWA DPWA TECN limits, e DPWA TECN limits, e DPWA DPWA TECN DPWA Limits, e DPWA DPWA	Multichannel Multichannel COMMENT tc. • • • Multichannel Multichannel COMMENT tc. • • • Multichannel Multichannel Multichannel Multichannel	Γ ₁₂ /Γ

N(1895) PHOTON DECAY AMPLITUDES AT THE POLE

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

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

N(1895) BREIT-WIGNER PHOTON DECAY AMPLITUDES

$N(1895) ightarrow p\gamma$, 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 of	data for averages,	fits,	limits, e	tc. • • •
0.012 ± 0.006	SHRESTHA 1	12A	DPWA	Multichannel

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

-/-			
DOCUMENT ID	TECN	COMMENT	
ANISOVICH 13B	DPWA	Multichannel	
ng data for averages, fits	, limits, et	tc. • • •	
SHRESTHA 12A	DPWA	Multichannel	
	ANISOVICH 13B	ANISOVICH 13B DPWA ag data for averages, fits, limits, e	DOCUMENT ID ANISOVICH 13B DPWA Multichannel ng data for averages, fits, limits, etc. • • SHRESTHA 12A DPWA Multichannel

N(1895) FOOTNOTES

N(1895) REFERENCES

DENISENKO SOKHOYAN SVARC ANISOVICH	16 15A 14 13B	PL B755 97 EPJ A51 95 PR C89 045205 EPJ A49 67	I. Denisenko <i>et al.</i> V. Sokhoyan <i>et al.</i> A. Svarc <i>et al.</i> A.V. Anisovich <i>et al.</i>	CBELSA/TAPS Collab.)
ANISOVICH	13B 12A	EPJ A49 07 EPJ A48 15	A.V. Anisovich <i>et al.</i>	(BONN, PNPI)
SHRESTHA	12A	PR C86 055203	M. Shrestha, D.M. Manley	(KSU)
BATINIC	10	PR C82 038203	M. Batinic et al.	(ŻAGR)
VRANA	00	PRPL 328 181	T.P. Vrana, S.A. Dytman, TS.H.	Lee (PITT, ANL)
CUTKOSKY	80	Toronto Conf. 19	R.E. Cutkosky <i>et al.</i>	(CMU, LBL) IJP
Also		PR D20 2839	R.E. Cutkosky et al.	(CMU, LBL)
HOEHLER	79	PDAT 12-1	G. Hohler <i>et al.</i>	` (KARLT) IJP
Also		Toronto Conf. 3	R. Koch	(KARLT) IJP

 $^{^{1}\,\}mathrm{Fit}$ to the amplitudes of HOEHLER 79.