

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

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

was $N(2090)$

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.

NODE=B004

NODE=B004

 $N(1895)$ POLE POSITION

NODE=B004215

REAL PART

VALUE (MeV)	DOCUMENT ID	TECN	COMMENT
1890 to 1930 (≈ 1910) OUR ESTIMATE			
1905 $\pm$ 15	SARANTSEV	25	DPWA Multichannel
1907 $\pm$ 10	AFZAL	20	DPWA Multichannel
1906 $\pm$ 17	¹ ANISOVICH	17A	L+P $\gamma p, \pi^- p \rightarrow K \Lambda$
1917 $\pm$ 19 $\pm$ 1	² SVARC	14	L+P $\pi N \rightarrow \pi N$
• • • We do not use the following data for averages, fits, limits, etc. • • •			
1956	HUNT	19	DPWA Multichannel
1907 $\pm$ 10	SOKHOYAN	15A	DPWA Multichannel
1797 $\pm$ 26	BATINIC	10	DPWA $\pi N \rightarrow N\pi, N\eta$
1795	VRANA	00	DPWA Multichannel
2150 $\pm$ 70	CUTKOSKY	80	IPWA $\pi N \rightarrow \pi N$

¹ Statistical error only.² Fit to the amplitudes of HOEHLER 79.NODE=B004RE
NODE=B004RE

→ UNCHECKED ←

OCCUR=3

–2×IMAGINARY PART

VALUE (MeV)	DOCUMENT ID	TECN	COMMENT
80 to 140 (≈ 110) OUR ESTIMATE			
185 $\pm$ 25	SARANTSEV	25	DPWA Multichannel
100 ⁺ _– 40 10	AFZAL	20	DPWA Multichannel
100 $\pm$ 10	¹ ANISOVICH	17A	L+P $\gamma p, \pi^- p \rightarrow K \Lambda$
101 $\pm$ 36 $\pm$ 1	^{1,2} SVARC	14	L+P $\pi N \rightarrow \pi N$
• • • We do not use the following data for averages, fits, limits, etc. • • •			
449	HUNT	19	DPWA Multichannel
100 ⁺ _– 40 15	SOKHOYAN	15A	DPWA Multichannel
420 $\pm$ 45	BATINIC	10	DPWA $\pi N \rightarrow N\pi, N\eta$
220	VRANA	00	DPWA Multichannel
350 $\pm$ 100	CUTKOSKY	80	IPWA $\pi N \rightarrow \pi N$

¹ Statistical error only.² Fit to the amplitudes of HOEHLER 79.NODE=B004RE;LINKAGE=B
NODE=B004RE;LINKAGE=SVNODE=B004IM
NODE=B004IM

→ UNCHECKED ←

OCCUR=3

 $N(1895)$ ELASTIC POLE RESIDUE

NODE=B004220

MODULUS $|r|$

VALUE (MeV)	DOCUMENT ID	TECN	COMMENT
1 to 5 (≈ 3) OUR ESTIMATE			
3 $\pm$ 2	SOKHOYAN	15A	DPWA Multichannel
3.1 $\pm$ 1.4	¹ SVARC	14	L+P $\pi N \rightarrow \pi N$
• • • We do not use the following data for averages, fits, limits, etc. • • •			
1 $\pm$ 1	ANISOVICH	12A	DPWA Multichannel
60	BATINIC	10	DPWA $\pi N \rightarrow N\pi, N\eta$
40 $\pm$ 20	CUTKOSKY	80	IPWA $\pi N \rightarrow \pi N$

¹ Fit to the amplitudes of HOEHLER 79.NODE=B004RER
NODE=B004RER
→ UNCHECKED ←

NODE=B004RER;LINKAGE=SV

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 $\pm$ 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 $\pi N \rightarrow N\pi, N\eta$

¹ Fit to the amplitudes of HOEHLER 79.NODE=B004IMR
NODE=B004IMR

NODE=B004IMR;LINKAGE=SV

$N(1895)$ INELASTIC POLE RESIDUE

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

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

MODULUS	PHASE ($^{\circ}$)	DOCUMENT ID	TECN	COMMENT
0.09 ± 0.03	8 ± 30	ANISOVICH	17A	DPWA Multichannel
0.06 ± 0.02	87 ± 27	¹ ANISOVICH	17A	L+P $\gamma p, \pi^- p \rightarrow K \Lambda$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.05 ± 0.02	-90 ± 30	ANISOVICH	12A	DPWA Multichannel

¹ Statistical error only.

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

MODULUS	PHASE ($^{\circ}$)	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 ($^{\circ}$)	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 ($^{\circ}$)	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
1870 to 1920 (≈ 1895) OUR ESTIMATE			
1907 ± 15	SARANTSEV	25	DPWA Multichannel
2000 ± 29	¹ HUNT	19	DPWA Multichannel
1890^{+9}_{-23}	KASHEVAROV	17	DPWA $\gamma p \rightarrow \eta p, \eta' p$
1880 ± 20	HOEHLER	79	IPWA $\pi N \rightarrow \pi N$
• • • We do not use the following data for averages, fits, limits, etc. • • •			
1905 ± 12	SOKHOYAN	15A	DPWA Multichannel
1910 ± 15	¹ SHRESTHA	12A	DPWA Multichannel
1812 ± 25	BATINIC	10	DPWA $\pi N \rightarrow N\pi, N\eta$
1822 ± 43	VRANA	00	DPWA Multichannel
2180 ± 80	CUTKOSKY	80	IPWA $\pi N \rightarrow \pi N$

¹ Statistical error only.

 $N(1895)$ BREIT-WIGNER WIDTH

VALUE (MeV)	DOCUMENT ID	TECN	COMMENT
80 to 200 (≈ 120) OUR ESTIMATE			
195 ± 20	SARANTSEV	25	DPWA Multichannel
466 ± 72	¹ HUNT	19	DPWA Multichannel
150 ± 57	KASHEVAROV	17	DPWA $\gamma p \rightarrow \eta p, \eta' p$
95 ± 30	HOEHLER	79	IPWA $\pi N \rightarrow \pi N$
• • • We do not use the following data for averages, fits, limits, etc. • • •			
100^{+30}_{-10}	SOKHOYAN	15A	DPWA Multichannel
502 ± 47	¹ SHRESTHA	12A	DPWA Multichannel
405 ± 40	BATINIC	10	DPWA $\pi N \rightarrow N\pi, N\eta$
248 ± 185	VRANA	00	DPWA Multichannel
350 ± 100	CUTKOSKY	80	IPWA $\pi N \rightarrow \pi N$

¹ Statistical error only.

NODE=B004240

NODE=B004240

NODE=B004RS2
NODE=B004RS2

OCCUR=2

NODE=B004RS2;LINKAGE=A

NODE=B004RS3
NODE=B004RS3

NODE=B004RS4
NODE=B004RS4

NODE=B004RS5
NODE=B004RS5

NODE=B004M

NODE=B004M
→ UNCHECKED ←

NODE=B004M;LINKAGE=D

NODE=B004W

NODE=B004W
→ UNCHECKED ←

NODE=B004W;LINKAGE=A

$N(1895)$ DECAY MODES

NODE=B004225;NODE=B004

Mode	Fraction (Γ_i/Γ)	
Γ_1 $N\pi$	2–18 %	DESIG=1
Γ_2 $N\eta$	15–45 %	DESIG=11
Γ_3 $N\eta'$	10–40 %	DESIG=17
Γ_4 $N\omega$	16–40 %	DESIG=15
Γ_5 ΛK	3–23 %	DESIG=2
Γ_6 ΣK	6–20 %	DESIG=12
Γ_7 $N\pi\pi$	17–74 %	DESIG=3;OUR EST
Γ_8 $\Delta(1232)\pi$	3–11 %	DESIG=5
Γ_9 $N\rho$	14–50 %	DESIG=6;OUR EST
Γ_{10} $N\rho, S=1/2$	<18 %	DESIG=7
Γ_{11} $N\rho, S=3/2$	14–32 %	DESIG=8
Γ_{12} $N\sigma$	<13 %	DESIG=9
Γ_{13} $N(1440)\pi$	2–12 %	DESIG=10
Γ_{14} $\Lambda K^*(892)$	4–9 %	DESIG=16
Γ_{15} $p\gamma$, helicity=1/2	0.01–0.06 %	DESIG=13;OUR EST
Γ_{16} $n\gamma$, helicity=1/2	0.003–0.05 %	DESIG=14;OUR EST

 $N(1895)$ BRANCHING RATIOS

NODE=B004230

$\Gamma(N\pi)/\Gamma_{\text{total}}$					Γ_1/Γ
VALUE (%)	DOCUMENT ID	TECN	COMMENT		
2-18 % OUR ESTIMATE					
6 $\pm$ 4	SEIFEN	25	DPWA	Multichannel	
8 $\pm$ 4	¹ HUNT	19	DPWA	Multichannel	
9 $\pm$ 5	HOEHLER	79	IPWA	$\pi N \rightarrow \pi N$	
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●					
2.5 $\pm$ 1.5	SOKHOYAN	15A	DPWA	Multichannel	
17 $\pm$ 2	¹ SHRESTHA	12A	DPWA	Multichannel	
32 $\pm$ 6	BATINIC	10	DPWA	$\pi N \rightarrow N\pi, N\eta$	
17 $\pm$ 3	VRANA	00	DPWA	Multichannel	
18 $\pm$ 8	CUTKOSKY	80	IPWA	$\pi N \rightarrow \pi N$	

¹ Statistical error only.

NODE=B004R1
 NODE=B004R1
 → UNCHECKED ←

$\Gamma(N\eta)/\Gamma_{\text{total}}$					Γ_2/Γ
VALUE (%)	DOCUMENT ID	TECN	COMMENT		
15–45 % OUR ESTIMATE					
10 $\pm$ 5	MUELLER	20	DPWA	Multichannel	
37 $\pm$ 9	¹ HUNT	19	DPWA	Multichannel	
10 $\pm$ 5	ANISOVICH	17C	DPWA	Multichannel	
20 $\pm$ 6	² KASHEVAROV	17	DPWA	$\gamma p \rightarrow \eta p, \eta' p$	
• • • We do not use the following data for averages, fits, limits, etc. • • •					
21 $\pm$ 6	ANISOVICH	12A	DPWA	Multichannel	
40 $\pm$ 4	¹ SHRESTHA	12A	DPWA	Multichannel	
22 $\pm$ 10	BATINIC	10	DPWA	$\pi N \rightarrow N\pi, N\eta$	
41 $\pm$ 4	VRANA	00	DPWA	Multichannel	

¹ Statistical error only.² Assuming $A_{1/2} = -0.030 \text{ GeV}^{-1/2}$.

NODE=B004R1;LINKAGE=A

NODE=B004R11
 NODE=B004R11
 → UNCHECKED ←

$\Gamma(N\eta')/\Gamma_{\text{total}}$					Γ_3/Γ
VALUE (%)	DOCUMENT ID	TECN	COMMENT		
10–40 % OUR ESTIMATE					
13 $\pm$ 5	ANISOVICH	17C	DPWA	Multichannel	
38 $\pm$ 20	¹ KASHEVAROV	17	DPWA	$\gamma p \rightarrow \eta p, \eta' p$	

¹ Assuming $A_{1/2} = -0.030 \text{ GeV}^{-1/2}$.

NODE=B004R11;LINKAGE=A

NODE=B004R11;LINKAGE=B

NODE=B004R02
 NODE=B004R02
 → UNCHECKED ←

$\Gamma(N\omega)/\Gamma_{\text{total}}$					Γ_4/Γ
VALUE (%)	DOCUMENT ID	TECN	COMMENT		
16–40 % OUR ESTIMATE					
28 $\pm$ 12	DENISENKO	16	DPWA	Multichannel	

NODE=B004R02;LINKAGE=A

NODE=B004R00
 NODE=B004R00
 → UNCHECKED ←

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

VALUE (%)

3-23 % OUR ESTIMATE

7 ± 4

18 ± 5

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

1.8 ± 0.8

¹ Statistical error only.

DOCUMENT ID

TECN

COMMENT

¹ HUNT 19 DPWA Multichannel

ANISOVICH 12A DPWA Multichannel

¹ SHRESTHA 12A DPWA Multichannel Γ_5/Γ

NODE=B004R12

NODE=B004R12

→ UNCHECKED ←

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

VALUE (%)

6-20 % OUR ESTIMATE

13 ± 7

ANISOVICH 12A DPWA Multichannel

 Γ_6/Γ

NODE=B004R13

NODE=B004R13

→ UNCHECKED ←

 $\Gamma(\Delta(1232)\pi)/\Gamma_{\text{total}}$

VALUE (%)

3-11 % OUR ESTIMATE

8 ± 3

5 ± 3

< 10

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

7 ± 4

7 ± 3

1 ± 1

¹ Statistical error only.

DOCUMENT ID

TECN

COMMENT

SARANTSEV 25 DPWA Multichannel

SEIFEN 25 DPWA Multichannel

¹ HUNT 19 DPWA Multichannel

SOKHOYAN 15A DPWA Multichannel

¹ SHRESTHA 12A DPWA Multichannel

VRANA 00 DPWA Multichannel

 Γ_8/Γ

NODE=B004R5

NODE=B004R5

→ UNCHECKED ←

 $\Gamma(N\rho)/\Gamma_{\text{total}}$

VALUE (%)

43 ± 15

DOCUMENT ID

TECN

COMMENT

SARANTSEV 25 DPWA Multichannel

 Γ_9/Γ

NODE=B004R03

NODE=B004R03

 $\Gamma(N\rho, S=1/2)/\Gamma_{\text{total}}$

VALUE (%)

< 18 % OUR ESTIMATE

18 ± 5

< 18

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

< 2

36 ± 1

¹ Statistical error only.

DOCUMENT ID

TECN

COMMENT

SARANTSEV 25 DPWA Multichannel

¹ HUNT 19 DPWA Multichannel¹ SHRESTHA 12A DPWA Multichannel

VRANA 00 DPWA Multichannel

 Γ_{10}/Γ

NODE=B004R7

NODE=B004R7

→ UNCHECKED ←

 $\Gamma(N\rho, S=3/2)/\Gamma_{\text{total}}$

VALUE (%)

14-32 % OUR ESTIMATE

25 ± 14

23 ± 9

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

9 ± 3

1 ± 1

¹ Statistical error only.

DOCUMENT ID

TECN

COMMENT

SARANTSEV 25 DPWA Multichannel

¹ HUNT 19 DPWA Multichannel¹ SHRESTHA 12A DPWA Multichannel

VRANA 00 DPWA Multichannel

 Γ_{11}/Γ

NODE=B004R8

NODE=B004R8

→ UNCHECKED ←

 $\Gamma(N\sigma)/\Gamma_{\text{total}}$

VALUE (%)

< 13 % OUR ESTIMATE

18 ± 6

11 ± 7

< 13

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

< 2

2 ± 1

¹ Statistical error only.

DOCUMENT ID

TECN

COMMENT

SARANTSEV 25 DPWA Multichannel

SEIFEN 25 DPWA Multichannel

¹ HUNT 19 DPWA Multichannel¹ SHRESTHA 12A DPWA Multichannel

VRANA 00 DPWA Multichannel

 Γ_{12}/Γ

NODE=B004R9

NODE=B004R9

→ UNCHECKED ←

NODE=B004R9;LINKAGE=A

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

VALUE (%)	DOCUMENT ID	TECN	COMMENT
2-12 % OUR ESTIMATE			
2 ± 2	SEIFEN	25	DPWA Multichannel
7 ± 5	¹ HUNT	19	DPWA Multichannel
• • • We do not use the following data for averages, fits, limits, etc. • • •			
2.5 ± 1.5	SOKHOYAN	15A	DPWA Multichannel
24 ± 4	¹ SHRESTHA	12A	DPWA Multichannel
2 ± 1	VRANA	00	DPWA Multichannel

¹ Statistical error only.

NODE=B004R10
 NODE=B004R10
 → UNCHECKED ←

 $\Gamma(\Lambda K^*(892))/\Gamma_{\text{total}}$ Γ_{14}/Γ

VALUE (%)	DOCUMENT ID	TECN	COMMENT
4-9 % OUR ESTIMATE			
6.3 ± 2.5	ANISOVICH	17B	DPWA Multichannel

NODE=B004R10;LINKAGE=A

NODE=B004R01
 NODE=B004R01
 → UNCHECKED ←

N(1895) PHOTON DECAY AMPLITUDES AT THE POLE

NODE=B004260

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

MODULUS (GeV ^{-1/2})	PHASE (°)	DOCUMENT ID	TECN	COMMENT
0.021 ± 0.006	150 ± 30	SARANTSEV	25	DPWA Multichannel
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.015 ± 0.006	145 ± 35	SOKHOYAN	15A	DPWA Multichannel

NODE=B004PA1
 NODE=B004PA1

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

MODULUS (GeV ^{-1/2})	PHASE (°)	DOCUMENT ID	TECN	COMMENT
-0.015 ± 0.010	60 ± 25	ANISOVICH	17E	DPWA Multichannel

NODE=B004PA2
 NODE=B004PA2

N(1895) BREIT-WIGNER PHOTON DECAY AMPLITUDES

NODE=B004235

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

VALUE (GeV ^{-1/2})	DOCUMENT ID	TECN	COMMENT
-0.021 ± 0.008	SARANTSEV	25	DPWA Multichannel
0.017 ± 0.005	¹ HUNT	19	DPWA Multichannel
• • • We do not use the following data for averages, fits, limits, etc. • • •			
-0.016 ± 0.006	SOKHOYAN	15A	DPWA Multichannel
0.012 ± 0.006	¹ SHRESTHA	12A	DPWA Multichannel

¹ Statistical error only.

NODE=B004A1
 NODE=B004A1

NODE=B004A1;LINKAGE=A

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

VALUE (GeV ^{-1/2})	DOCUMENT ID	TECN	COMMENT
0.002 ± 0.013	¹ HUNT	19	DPWA Multichannel
-0.014 ± 0.010	ANISOVICH	17E	DPWA Multichannel
• • • We do not use the following data for averages, fits, limits, etc. • • •			
0.013 ± 0.006	ANISOVICH	13B	DPWA Multichannel
0.003 ± 0.007	¹ SHRESTHA	12A	DPWA Multichannel

¹ Statistical error only.

NODE=B004A3
 NODE=B004A3

NODE=B004A3;LINKAGE=A

N(1895) REFERENCES

NODE=B004

SARANTSEV	25	PR C112 015202	A.V. Sarantsev <i>et al.</i>	(Bonn-Gatchina Collab.)
SEIFEN	25	EPJ A61 173	T. Seifen <i>et al.</i>	(CBELSA/TAPS Collab.)
AFZAL	20	PRL 125 152002	F. Afzal <i>et al.</i>	(CBELSA/TAPS Collab.)
MUELLER	20	PL B803 135323	J. Mueller <i>et al.</i>	(CBELSA/TAPS Collab.)
HUNT	19	PR C99 055205	B.C. Hunt, D.M. Manley	
ANISOVICH	17A	PRL 119 062004	A.V. Anisovich <i>et al.</i>	
ANISOVICH	17B	PL B771 142	A.V. Anisovich <i>et al.</i>	
ANISOVICH	17C	PL B772 247	A.V. Anisovich <i>et al.</i>	
ANISOVICH	17E	PR C96 055202	A.V. Anisovich <i>et al.</i>	(BONN, PNPI, JLAB+)
KASHEVAROV	17	PRL 118 212001	V.L. Kashevarov <i>et al.</i>	(A2/MAMI Collab.)
DENISENKO	16	PL B755 97	I. Denisenko <i>et al.</i>	
SOKHOYAN	15A	EPJ A51 95	V. Sokhoyan <i>et al.</i>	(CBELSA/TAPS Collab.)
SVARC	14	PR C89 045205	A. Svarc <i>et al.</i>	(RBI Zagreb, UNI Tuzla)
ANISOVICH	13B	EPJ A49 67	A.V. Anisovich <i>et al.</i>	
ANISOVICH	12A	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 <i>et al.</i>	(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 <i>et al.</i>	(CMU, LBL) IJP
Also		PR D20 2839	R.E. Cutkosky <i>et al.</i>	(CMU, LBL)
HOEHLER	79	PDAT 12-1	G. Hohler <i>et al.</i>	(KARLT) IJP
Also		Toronto Conf. 3	R. Koch	(KARLT) IJP

REFID=63294

REFID=63593

REFID=60951

REFID=60391

REFID=59985

REFID=57949

REFID=58101

REFID=58174

REFID=62311

REFID=57930

REFID=57504

REFID=56757

REFID=55775

REFID=56147

REFID=54041

REFID=54862

REFID=53552

REFID=47593

REFID=30064

REFID=40096

REFID=30058

REFID=30859