NODE=B006

$N(2000)\ 5/2^+$

$I(J^P) = \frac{1}{2}(\frac{5}{2}^+)$ Status: ∗∗

OMITTED FROM SUMMARY TABLE
was $N(1900)$

NODE=B006

Before the 2012 *Review*, all the evidence for a $J^P = 5/2^+$ state with a mass above 1800 MeV was filed under a two-star $N(2000)$. There is now some evidence from ANISOVICH 12A for two $5/2^+$ states in this region, so we have split the older data (according to mass) between two two-star $5/2^+$ states, an $N(1860)$ and an $N(2000)$.

$N(2000)$ POLE POSITION

NODE=B006211

REAL PART

NODE=B006RE
NODE=B006RE

VALUE (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
1990±40	SARANTSEV	25	DPWA	Multichannel
• • • We do not use the following data for averages, fits, limits, etc. • • •				
2030±40	SOKHOYAN	15A	DPWA	Multichannel
1900	SHKLYAR	13	DPWA	Multichannel

−2×IMAGINARY PART

NODE=B006IM
NODE=B006IM

VALUE (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
480±60	SARANTSEV	25	DPWA	Multichannel
• • • We do not use the following data for averages, fits, limits, etc. • • •				
380±60	SOKHOYAN	15A	DPWA	Multichannel
123	SHKLYAR	13	DPWA	Multichannel

$N(2000)$ ELASTIC POLE RESIDUE

NODE=B006212

MODULUS $|r|$

NODE=B006RER
NODE=B006RER

VALUE (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
18± 8	SOKHOYAN	15A	DPWA	Multichannel
• • • We do not use the following data for averages, fits, limits, etc. • • •				
11	SHKLYAR	13	DPWA	Multichannel
35^{+80}_{-15}	ANISOVICH	12A	DPWA	Multichannel

PHASE θ

NODE=B006IMR
NODE=B006IMR

VALUE (°)	*DOCUMENT ID*		*TECN*	*COMMENT*
−150±40	SOKHOYAN	15A	DPWA	Multichannel
• • • We do not use the following data for averages, fits, limits, etc. • • •				
− 6	SHKLYAR	13	DPWA	Multichannel
−100±40	ANISOVICH	12A	DPWA	Multichannel

$N(2000)$ INELASTIC POLE RESIDUE

NODE=B006240

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

NODE=B006240

Normalized residue in $N\pi \rightarrow N(2000) \rightarrow \Delta(1232)\pi$, P-wave

NODE=B006RS1
NODE=B006RS1

MODULUS	*PHASE* (°)	*DOCUMENT ID*		*TECN*	*COMMENT*
0.16±0.06	100 ± 50	SOKHOYAN	15A	DPWA	Multichannel

Normalized residue in $N\pi \rightarrow N(2000) \rightarrow \Delta(1232)\pi$, F-wave

NODE=B006RS2
NODE=B006RS2

MODULUS	*PHASE* (°)	*DOCUMENT ID*		*TECN*	*COMMENT*
0.20±0.10	−20 ± 45	SOKHOYAN	15A	DPWA	Multichannel

Normalized residue in $N\pi \rightarrow N(2000) \rightarrow N\sigma$

NODE=B006RS3
NODE=B006RS3

MODULUS	*PHASE* (°)	*DOCUMENT ID*		*TECN*	*COMMENT*
0.12±0.06	80 ± 40	SOKHOYAN	15A	DPWA	Multichannel

Normalized residue in $N\pi \rightarrow N(2000) \rightarrow N(1520)\pi$, D-wave

NODE=B006RS4
NODE=B006RS4

MODULUS	PHASE (°)	DOCUMENT ID		TECN	COMMENT
0.17±0.09	−60 ± 35	SOKHOYAN	15A	DPWA	Multichannel

N(2000) BREIT-WIGNER MASS

NODE=B006M

NODE=B006M

VALUE (MeV)	DOCUMENT ID		TECN	COMMENT
2050±40	SARANTSEV	25	DPWA	Multichannel
1946± 4	[1] SHKLYAR	13	DPWA	Multichannel
• • • We do not use the following data for averages, fits, limits, etc. • • •				
2060±30	SOKHOYAN	15A	DPWA	Multichannel

[1] Statistical error only.

NODE=B006M;LINKAGE=A

N(2000) BREIT-WIGNER WIDTH

NODE=B006W

NODE=B006W

VALUE (MeV)	DOCUMENT ID		TECN	COMMENT
500±60	SARANTSEV	25	DPWA	Multichannel
198± 2	[2] SHKLYAR	13	DPWA	Multichannel
• • • We do not use the following data for averages, fits, limits, etc. • • •				
390±55	SOKHOYAN	15A	DPWA	Multichannel

[2] Statistical error only.

NODE=B006W;LINKAGE=A

N(2000) DECAY MODES

NODE=B006215;NODE=B006

	Mode	Fraction (Γ_i/Γ)	
Γ_1	$N\pi$	6–10 %	DESIG=1;OUR EST
Γ_2	$N\eta$	<4 %	DESIG=2;OUR EST
Γ_3	$N\omega$	<2 %	DESIG=14;OUR EST
Γ_4	$N\pi\pi$	35–90 %	DESIG=13;OUR EST
Γ_5	$\Delta(1232)\pi$	30–80 %	DESIG=10;OUR EST
Γ_6	$\Delta(1232)\pi$, P-wave	12–32 %	DESIG=8;OUR EST
Γ_7	$\Delta(1232)\pi$, F-wave	19–49 %	DESIG=15;OUR EST
Γ_8	$N\rho$	(15 ±4) %	DESIG=22
Γ_9	$N\rho$, S=1/2	(8.0±3.0) %	DESIG=23
Γ_{10}	$N\rho$, S=3/2 , P-wave	(7.0±3.0) %	DESIG=24
Γ_{11}	$N\sigma$	5–15 %	DESIG=5;OUR EST
Γ_{12}	$N(1520)\pi$, D-wave	11–31 %	DESIG=6;OUR EST
Γ_{13}	$N(1680)\pi$, P-wave	17–25 %	DESIG=7;OUR EST
Γ_{14}	$\Lambda K^*(892)$	1–3 %	DESIG=21
Γ_{15}	$p\gamma$	0.01–0.08 %	DESIG=9;OUR EST
Γ_{16}	$p\gamma$, helicity=1/2	0.003–0.031 %	DESIG=16;OUR EST
Γ_{17}	$p\gamma$, helicity=3/2	0.008–0.048 %	DESIG=17;OUR EST
Γ_{18}	$n\gamma$	0.002–0.07 %	DESIG=18;OUR EST
Γ_{19}	$n\gamma$, helicity=1/2	<0.017 %	DESIG=19;OUR EST
Γ_{20}	$n\gamma$, helicity=3/2	0.001–0.056 %	DESIG=20;OUR EST

N(2000) BRANCHING RATIOS

NODE=B006220

$\Gamma(N\pi)/\Gamma_{total}$ Γ_1/Γ

NODE=B006R1
NODE=B006R1

VALUE (%)	DOCUMENT ID		TECN	COMMENT
6 to 10 (≈ 8) OUR ESTIMATE				
11±5	SEIFEN	25	DPWA	Multichannel
10±1	[3] SHKLYAR	13	DPWA	Multichannel
• • • We do not use the following data for averages, fits, limits, etc. • • •				
8±4	SOKHOYAN	15A	DPWA	Multichannel

→ UNCHECKED ←

[3] Statistical error only.

NODE=B006R1;LINKAGE=A

$\Gamma(N\eta)/\Gamma_{total}$ Γ_2/Γ

NODE=B006R13
NODE=B006R13

VALUE (%)	DOCUMENT ID		TECN	COMMENT
2±2	MUELLER	20	DPWA	Multichannel
2±2	[4] SHKLYAR	13	DPWA	Multichannel

[4] Statistical error only.

NODE=B006R13;LINKAGE=A

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

NODE=B006R14
NODE=B006R14

VALUE (%)	DOCUMENT ID		TECN	COMMENT
18±8	DENISENKO	16	DPWA	Multichannel
1±1	[5] SHKLYAR	13	DPWA	Multichannel

[5] Statistical error only.

NODE=B006R14;LINKAGE=A

$\Gamma(\Delta(1232)\pi)/\Gamma_{total}$ — Γ_5/Γ

NODE=B006R05
NODE=B006R05

VALUE (%)	DOCUMENT ID		TECN	COMMENT
25±6	SARANTSEV	25	DPWA	Multichannel

$\Gamma(\Delta(1232)\pi$, P-wave$)/\Gamma_{total}$ — Γ_6/Γ

NODE=B006R18
NODE=B006R18

VALUE (%)	DOCUMENT ID		TECN	COMMENT
8± 4	SARANTSEV	25	DPWA	Multichannel
9± 4	SEIFEN	25	DPWA	Multichannel
• • • We do not use the following data for averages, fits, limits, etc. • • •				
22±10	SOKHOYAN	15A	DPWA	Multichannel

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

NODE=B006R19
NODE=B006R19

VALUE (%)	DOCUMENT ID		TECN	COMMENT
17± 4	SARANTSEV	25	DPWA	Multichannel
16± 4	SEIFEN	25	DPWA	Multichannel
• • • We do not use the following data for averages, fits, limits, etc. • • •				
34±15	SOKHOYAN	15A	DPWA	Multichannel

$\Gamma(N\rho)/\Gamma_{total}$ — Γ_8/Γ

NODE=B006R01
NODE=B006R01

VALUE (%)	DOCUMENT ID		TECN	COMMENT
15±4	SARANTSEV	25	DPWA	Multichannel

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

NODE=B006R02
NODE=B006R02

VALUE (%)	DOCUMENT ID		TECN	COMMENT
8±3	SARANTSEV	25	DPWA	Multichannel

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

NODE=B006R03
NODE=B006R03

VALUE (%)	DOCUMENT ID		TECN	COMMENT
7±3	SARANTSEV	25	DPWA	Multichannel

$\Gamma(N\sigma)/\Gamma_{total}$ — Γ_{11}/Γ

NODE=B006R15
NODE=B006R15

VALUE (%)	DOCUMENT ID		TECN	COMMENT
28±10	SARANTSEV	25	DPWA	Multichannel
28±15	SEIFEN	25	DPWA	Multichannel
• • • We do not use the following data for averages, fits, limits, etc. • • •				
10± 5	SOKHOYAN	15A	DPWA	Multichannel

$\Gamma(N(1520)\pi$, D-wave$)/\Gamma_{total}$ — Γ_{12}/Γ

NODE=B006R16
NODE=B006R16

VALUE (%)	DOCUMENT ID		TECN	COMMENT
2± 2	SEIFEN	25	DPWA	Multichannel
• • • We do not use the following data for averages, fits, limits, etc. • • •				
21±10	SOKHOYAN	15A	DPWA	Multichannel

$\Gamma(N(1680)\pi$, P-wave$)/\Gamma_{total}$ — Γ_{13}/Γ

NODE=B006R17
NODE=B006R17

VALUE (%)	DOCUMENT ID		TECN	COMMENT
28±9	SEIFEN	25	DPWA	Multichannel
• • • We do not use the following data for averages, fits, limits, etc. • • •				
16±9	SOKHOYAN	15A	DPWA	Multichannel

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

NODE=B006R00
NODE=B006R00

VALUE (%)	DOCUMENT ID		TECN	COMMENT
1–3 % OUR EVALUATION				
2.2±1.0	ANISOVICH	17B	DPWA	Multichannel

→ UNCHECKED ←

$N(2000)$ PHOTON DECAY AMPLITUDES AT THE POLE

NODE=B006260

$N(2000) \rightarrow p\gamma$, helicity-1/2 amplitude $A_{1/2}$

NODE=B006PA1
NODE=B006PA1

MODULUS ($GeV^{-1/2}$)	PHASE (°)	DOCUMENT ID		TECN	COMMENT
0.033 ± 0.006	35 ± 25	SARANTSEV	25	DPWA	Multichannel
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.033 ± 0.010	15 ± 25	SOKHOYAN	15A	DPWA	Multichannel

$N(2000) \rightarrow p\gamma$, helicity-3/2 amplitude $A_{3/2}$

NODE=B006PA2
NODE=B006PA2

MODULUS ($GeV^{-1/2}$)	PHASE (°)	DOCUMENT ID		TECN	COMMENT
0.043 ± 0.012	-100 ± 30	SARANTSEV	25	DPWA	Multichannel
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.045 ± 0.008	-140 ± 25	SOKHOYAN	15A	DPWA	Multichannel

$N(2000) \rightarrow n\gamma$, helicity-1/2 amplitude $A_{1/2}$

NODE=B006PA3
NODE=B006PA3

MODULUS ($GeV^{-1/2}$)	PHASE (°)	DOCUMENT ID		TECN	COMMENT
0.019 ± 0.010	-80 ± 40	ANISOVICH	17E	DPWA	Multichannel

$N(2000) \rightarrow n\gamma$, helicity-3/2 amplitude $A_{3/2}$

NODE=B006PA4
NODE=B006PA4

MODULUS ($GeV^{-1/2}$)	PHASE (°)	DOCUMENT ID		TECN	COMMENT
0.011 ± 0.005	82 ± 30	ANISOVICH	17E	DPWA	Multichannel

$N(2000)$ BREIT-WIGNER PHOTON DECAY AMPLITUDES

NODE=B006225

$N(2000) \rightarrow p\gamma$, helicity-1/2 amplitude $A_{1/2}$

NODE=B006A1
NODE=B006A1

VALUE ($GeV^{-1/2}$)	DOCUMENT ID		TECN	COMMENT
0.033 ± 0.006	SARANTSEV	25	DPWA	Multichannel
0.011 ± 0.001	[6] SHKLYAR	13	DPWA	Multichannel
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.031 ± 0.010	SOKHOYAN	15A	DPWA	Multichannel

[6] Statistical error only.

NODE=B006A1;LINKAGE=A

$N(2000) \rightarrow p\gamma$, helicity-3/2 amplitude $A_{3/2}$

NODE=B006A2
NODE=B006A2

VALUE ($GeV^{-1/2}$)	DOCUMENT ID		TECN	COMMENT
-0.044 ± 0.012	SARANTSEV	25	DPWA	Multichannel
0.025 ± 0.001	[7] SHKLYAR	13	DPWA	Multichannel
• • • We do not use the following data for averages, fits, limits, etc. • • •				
-0.043 ± 0.008	SOKHOYAN	15A	DPWA	Multichannel

[7] Statistical error only.

NODE=B006A2;LINKAGE=A

$N(2000) \rightarrow n\gamma$, helicity-1/2 amplitude $A_{1/2}$

NODE=B006A3
NODE=B006A3

VALUE ($GeV^{-1/2}$)	DOCUMENT ID		TECN	COMMENT
-0.018 ± 0.012	ANISOVICH	13B	DPWA	Multichannel

$N(2000) \rightarrow n\gamma$, helicity-3/2 amplitude $A_{3/2}$

NODE=B006A4
NODE=B006A4

VALUE ($GeV^{-1/2}$)	DOCUMENT ID		TECN	COMMENT
-0.035 ± 0.020	ANISOVICH	13B	DPWA	Multichannel

$N(2000)$ REFERENCES

NODE=B006

SARANTSEV	25	PR C112 015202	A.V. Sarantsev *et al.*	(Bonn-Gatchina Collab.)	REFID=63294
SEIFEN	25	EPJ A61 173	T. Seifen *et al.*	(CBELSA/TAPS Collab.)	REFID=63593
MUELLER	20	PL B803 135323	J. Mueller *et al.*	(CBELSA/TAPS Collab.)	REFID=60391
ANISOVICH	17B	PL B771 142	A.V. Anisovich *et al.*		REFID=58101
ANISOVICH	17E	PR C96 055202	A.V. Anisovich *et al.*	(BONN, PNPI, JLAB+)	REFID=62311
DENISENKO	16	PL B755 97	I. Denisenko *et al.*		REFID=57504
SOKHOYAN	15A	EPJ A51 95	V. Sokhoyan *et al.*	(CBELSA/TAPS Collab.)	REFID=56757
ANISOVICH	13B	EPJ A49 67	A.V. Anisovich *et al.*		REFID=56147
SHKLYAR	13	PR C87 015201	V. Shklyar, H. Lenske, U. Mosel	(GIES)	REFID=55104
ANISOVICH	12A	EPJ A48 15	A.V. Anisovich *et al.*	(BONN, PNPI)	REFID=54041