N(2060) 5/2$^-$

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

OMITTED FROM SUMMARY TABLE

Before our 2012 *Review*, this state appeared in our Listings as the $N(2200)$.

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

N(2060) BREIT-WIGNER MASS

VALUE (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
≈ 2060 OUR ESTIMATE				
2060±15	ANISOVICH	12A	DPWA	Multichannel
1900	BELL	83	DPWA	$\pi^- p \to \Lambda K^0$
2180±80	CUTKOSKY	80	IPWA	$\pi N \to \pi N$
1920	SAXON	80	DPWA	$\pi^- p \to \Lambda K^0$
2228±30	HOEHLER	79	IPWA	$\pi N \to \pi N$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
2217±27	BATINIC	10	DPWA	$\pi N \to N\pi, N\eta$

N(2060) BREIT-WIGNER WIDTH

VALUE (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
375± 25	ANISOVICH	12A	DPWA	Multichannel
130	BELL	83	DPWA	$\pi^- p \to \Lambda K^0$
400±100	CUTKOSKY	80	IPWA	$\pi N \to \pi N$
220	SAXON	80	DPWA	$\pi^- p \to \Lambda K^0$
310± 50	HOEHLER	79	IPWA	$\pi N \to \pi N$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
481± 17	BATINIC	10	DPWA	$\pi N \to N\pi, N\eta$

N(2060) POLE POSITION

REAL PART

VALUE (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
2040±15	ANISOVICH	12A	DPWA	Multichannel
2100±60	CUTKOSKY	80	IPWA	$\pi N \to \pi N$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
2144±31	BATINIC	10	DPWA	$\pi N \to N\pi, N\eta$

−2×IMAGINARY PART

VALUE (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
390±25	ANISOVICH	12A	DPWA	Multichannel
360±80	CUTKOSKY	80	IPWA	$\pi N \to \pi N$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
438±13	BATINIC	10	DPWA	$\pi N \to N\pi, N\eta$

N(2060) ELASTIC POLE RESIDUE

MODULUS |r|

VALUE (MeV)	DOCUMENT ID		TECN	COMMENT
19± 5	ANISOVICH	12A	DPWA	Multichannel
20±10	CUTKOSKY	80	IPWA	$\pi N \to \pi N$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
26	BATINIC	10	DPWA	$\pi N \to N\pi$, $N\eta$

PHASE θ

VALUE (°)	DOCUMENT ID		TECN	COMMENT
−125±20	ANISOVICH	12A	DPWA	Multichannel
− 90±50	CUTKOSKY	80	IPWA	$\pi N \to \pi N$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
− 71	BATINIC	10	DPWA	$\pi N \to N\pi$, $N\eta$

N(2060) INELASTIC POLE RESIDUE

The "normalized residue" is the residue divided by Γ_{pole}.

Normalized residue in $N\pi \to N(2060) \to N\eta$

MODULUS (%)	PHASE (°)	DOCUMENT ID		TECN	COMMENT
5±3	40 ± 25	ANISOVICH	12A	DPWA	Multichannel

Normalized residue in $N\pi \to N(2060) \to \Lambda K$

MODULUS (%)	DOCUMENT ID		TECN	COMMENT
1±0.5	ANISOVICH	12A	DPWA	Multichannel

Normalized residue in $N\pi \to N(2060) \to \Sigma K$

MODULUS (%)	PHASE (°)	DOCUMENT ID		TECN	COMMENT
4±2	−70 ± 30	ANISOVICH	12A	DPWA	Multichannel

N(2060) DECAY MODES

	Mode
Γ_1	$N\pi$
Γ_2	$N\eta$
Γ_3	ΛK
Γ_4	ΣK

N(2060) BRANCHING RATIOS

$\Gamma(N\pi)/\Gamma_{total}$ — Γ_1/Γ

VALUE (%)	DOCUMENT ID		TECN	COMMENT
8±2	ANISOVICH	12A	DPWA	Multichannel
10±3	CUTKOSKY	80	IPWA	$\pi N \to \pi N$
7±2	HOEHLER	79	IPWA	$\pi N \to \pi N$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
13±4	BATINIC	10	DPWA	$\pi N \to N\pi$, $N\eta$

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

VALUE (%)	DOCUMENT ID		TECN	COMMENT
4 ±2	ANISOVICH	12A	DPWA	Multichannel
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.2±1.0	BATINIC	10	DPWA	$\pi N \to N\pi$, $N\eta$

$(\Gamma_i\Gamma_f)^{1/2}/\Gamma_{total}$ in $N\pi \to N(2060) \to N\eta$ — $(\Gamma_1\Gamma_2)^{1/2}/\Gamma$

VALUE	DOCUMENT ID		TECN	COMMENT
0.066	BAKER	79	DPWA	$\pi^- p \to n\eta$

$(\Gamma_i\Gamma_f)^{1/2}/\Gamma_{total}$ in $N\pi \to N(2060) \to \Lambda K$ — $(\Gamma_1\Gamma_3)^{1/2}/\Gamma$

VALUE	DOCUMENT ID		TECN	COMMENT
−0.03	BELL	83	DPWA	$\pi^- p \to \Lambda K^0$
−0.05	SAXON	80	DPWA	$\pi^- p \to \Lambda K^0$

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

VALUE (%)	DOCUMENT ID		TECN	COMMENT
3±2	ANISOVICH	12A	DPWA	Multichannel

N(2060) PHOTON DECAY AMPLITUDES

Papers on γN amplitudes predating 1981 may be found in our 2006 edition, Journal of Physics, G **33** 1 (2006).

$N(2060) \to p\gamma$, helicity-1/2 amplitude $A_{1/2}$

VALUE ($GeV^{-1/2}$)	DOCUMENT ID		TECN	COMMENT
0.065±0.012	[1] ANISOVICH	12A	DPWA	Phase = $(15 \pm 8)^\circ$

$N(2060) \to p\gamma$, helicity-3/2 amplitude $A_{3/2}$

VALUE ($GeV^{-1/2}$)	DOCUMENT ID		TECN	COMMENT
0.055^{+15}_{-35}	[1] ANISOVICH	12A	DPWA	Phase = $(15 \pm 10)^\circ$

N(2060) FOOTNOTES

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

N(2060) 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)
PDG	06	JPG 33 1	W.-M. Yao et al.	(PDG Collab.)
BELL	83	NP B222 389	K.W. Bell et al.	(RL) IJP
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
BAKER	79	NP B156 93	R.D. Baker et al.	(RHEL) IJP
HOEHLER	79	PDAT 12-1	G. Hohler et al.	(KARLT) IJP
Also		Toronto Conf. 3	R. Koch	(KARLT) IJP