$N(2250)$ G_{19}

$I(J^P) = \frac{1}{2}(\frac{9}{2}^-)$ Status: ∗∗∗∗

Some obsolete results published before 1980 were last included in our 2006 edition, Journal of Physics, G **33** 1 (2006).

N(2250) BREIT-WIGNER MASS

VALUE (MeV)	DOCUMENT ID		TECN	COMMENT
2200 to 2350 (≈ 2275) OUR ESTIMATE				
2302± 6	ARNDT	06	DPWA	$\pi N \rightarrow \pi N, \eta N$
2250± 80	CUTKOSKY	80	IPWA	$\pi N \rightarrow \pi N$
2268± 15	HOEHLER	79	IPWA	$\pi N \rightarrow \pi N$
2200±100	HENDRY	78	MPWA	$\pi N \rightarrow \pi N$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
2376± 43	ARNDT	04	DPWA	$\pi N \rightarrow \pi N, \eta N$
2291	ARNDT	95	DPWA	$\pi N \rightarrow N\pi$

N(2250) BREIT-WIGNER WIDTH

VALUE (MeV)	DOCUMENT ID		TECN	COMMENT
230 to 800 (≈ 500) OUR ESTIMATE				
628± 28	ARNDT	06	DPWA	$\pi N \rightarrow \pi N, \eta N$
480±120	CUTKOSKY	80	IPWA	$\pi N \rightarrow \pi N$
300± 40	HOEHLER	79	IPWA	$\pi N \rightarrow \pi N$
350±100	HENDRY	78	MPWA	$\pi N \rightarrow \pi N$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
924±178	ARNDT	04	DPWA	$\pi N \rightarrow \pi N, \eta N$
772	ARNDT	95	DPWA	$\pi N \rightarrow N\pi$

N(2250) POLE POSITION

REAL PART

VALUE (MeV)	DOCUMENT ID		TECN	COMMENT
2150 to 2250 (≈ 2200) OUR ESTIMATE				
2217	ARNDT	06	DPWA	$\pi N \rightarrow \pi N, \eta N$
2187	[1] HOEHLER	93	SPED	$\pi N \rightarrow \pi N$
2150±50	CUTKOSKY	80	IPWA	$\pi N \rightarrow \pi N$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
2238	ARNDT	04	DPWA	$\pi N \rightarrow \pi N, \eta N$
2087	ARNDT	95	DPWA	$\pi N \rightarrow N\pi$
2243	ARNDT	91	DPWA	$\pi N \rightarrow \pi N$ Soln SM90

−2×IMAGINARY PART

VALUE (MeV)	DOCUMENT ID		TECN	COMMENT
350 to 550 (≈ 450) OUR ESTIMATE				
431	ARNDT	06	DPWA	$\pi N \rightarrow \pi N, \eta N$
388	[1] HOEHLER	93	SPED	$\pi N \rightarrow \pi N$
360±100	CUTKOSKY	80	IPWA	$\pi N \rightarrow \pi N$

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

536	ARNDT	04	DPWA	$\pi N \to \pi N, \eta N$
680	ARNDT	95	DPWA	$\pi N \to N\pi$
650	ARNDT	91	DPWA	$\pi N \to \pi N$ Soln SM90

N(2250) ELASTIC POLE RESIDUE

MODULUS $|r|$

VALUE (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
21	ARNDT	06	DPWA	$\pi N \to \pi N, \eta N$
21	HOEHLER	93	SPED	$\pi N \to \pi N$
20±6	CUTKOSKY	80	IPWA	$\pi N \to \pi N$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
33	ARNDT	04	DPWA	$\pi N \to \pi N, \eta N$
24	ARNDT	95	DPWA	$\pi N \to N\pi$
47	ARNDT	91	DPWA	$\pi N \to \pi N$ Soln SM90

PHASE θ

VALUE (°)	*DOCUMENT ID*		*TECN*	*COMMENT*
−20	ARNDT	06	DPWA	$\pi N \to \pi N, \eta N$
−50±20	CUTKOSKY	80	IPWA	$\pi N \to \pi N$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
−25	ARNDT	04	DPWA	$\pi N \to \pi N, \eta N$
−44	ARNDT	95	DPWA	$\pi N \to N\pi$
−37	ARNDT	91	DPWA	$\pi N \to \pi N$ Soln SM90

N(2250) DECAY MODES

The following branching fractions are our estimates, not fits or averages.

	Mode	Fraction (Γ_i/Γ)
Γ_1	$N\pi$	5–15 %
Γ_2	$N\eta$	
Γ_3	ΛK	

N(2250) BRANCHING RATIOS

$\Gamma(N\pi)/\Gamma_{\text{total}}$ Γ_1/Γ

VALUE	*DOCUMENT ID*		*TECN*	*COMMENT*
0.05 to 0.15 OUR ESTIMATE				
0.089±0.001	ARNDT	06	DPWA	$\pi N \to \pi N, \eta N$
0.10 ±0.02	CUTKOSKY	80	IPWA	$\pi N \to \pi N$
0.10 ±0.02	HOEHLER	79	IPWA	$\pi N \to \pi N$
0.09 ±0.02	HENDRY	78	MPWA	$\pi N \to \pi N$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.110±0.004	ARNDT	04	DPWA	$\pi N \to \pi N, \eta N$
0.10	ARNDT	95	DPWA	$\pi N \to N\pi$

$(\Gamma_i \Gamma_f)^{1/2}/\Gamma_{total}$ in $N\pi \rightarrow N(2250) \rightarrow \Lambda K$ $(\Gamma_1 \Gamma_3)^{1/2}/\Gamma$

VALUE	DOCUMENT ID		TECN	COMMENT
-0.02	BELL	83	DPWA	$\pi^- p \rightarrow \Lambda K^0$
not seen	SAXON	80	DPWA	$\pi^- p \rightarrow \Lambda K^0$

N(2250) FOOTNOTES

[1] See HOEHLER 93 for a detailed discussion of the evidence for and the pole parameters of N and Δ resonances as determined from Argand diagrams of πN elastic partial-wave amplitudes and from plots of the speeds with which the amplitudes traverse the diagrams.

N(2250) REFERENCES

ARNDT	06	PR C74 045205	R.A. Arndt *et al.*	(GWU)
PDG	06	JPG 33 1	W.-M. Yao *et al.*	(PDG Collab.)
ARNDT	04	PR C69 035213	R.A. Arndt *et al.*	(GWU, TRIU)
ARNDT	95	PR C52 2120	R.A. Arndt *et al.*	(VPI, BRCO)
HOEHLER	93	πN Newsletter 9 1	G. Hohler	(KARL)
ARNDT	91	PR D43 2131	R.A. Arndt *et al.*	(VPI, TELE) IJP
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) IJP
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
HENDRY	78	PRL 41 222	A.W. Hendry	(IND, LBL) IJP
Also		ANP 136 1	A.W. Hendry	(IND)