

$N(2250) G_{19}$

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

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

<u>VALUE (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
2200 to 2350 (\approx 2275) OUR ESTIMATE			
2302 \pm 6	ARNDT	06	DPWA $\pi N \rightarrow \pi N, \eta N$
2250 \pm 80	CUTKOSKY	80	IPWA $\pi N \rightarrow \pi N$
2268 \pm 15	HOEHLER	79	IPWA $\pi N \rightarrow \pi N$
2200 \pm 100	HENDRY	78	MPWA $\pi N \rightarrow \pi N$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
2376 \pm 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

<u>VALUE (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
230 to 800 (\approx 500) OUR ESTIMATE			
628 \pm 28	ARNDT	06	DPWA $\pi N \rightarrow \pi N, \eta N$
480 \pm 120	CUTKOSKY	80	IPWA $\pi N \rightarrow \pi N$
300 \pm 40	HOEHLER	79	IPWA $\pi N \rightarrow \pi N$
350 \pm 100	HENDRY	78	MPWA $\pi N \rightarrow \pi N$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
924 \pm 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**

<u>VALUE (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
2150 to 2250 (\approx 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 \pm 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

<u>VALUE (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
350 to 550 (\approx 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 \pm 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	$\pi N \rightarrow \pi N, \eta N$
680	ARNDT	95	DPWA	$\pi N \rightarrow N\pi$
650	ARNDT	91	DPWA	$\pi N \rightarrow \pi N$ Soln SM90

***N*(2250) ELASTIC POLE RESIDUE**

MODULUS $|r|$

<u>VALUE (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
21	ARNDT	06	DPWA $\pi N \rightarrow \pi N, \eta N$
21	HOEHLER	93	SPED $\pi N \rightarrow \pi N$
20 ± 6	CUTKOSKY	80	IPWA $\pi N \rightarrow \pi N$

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

33	ARNDT	04	DPWA	$\pi N \rightarrow \pi N, \eta N$
24	ARNDT	95	DPWA	$\pi N \rightarrow N\pi$
47	ARNDT	91	DPWA	$\pi N \rightarrow \pi N$ Soln SM90

PHASE θ

<u>VALUE (°)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
−20	ARNDT	06	DPWA $\pi N \rightarrow \pi N, \eta N$
−50 ± 20	CUTKOSKY	80	IPWA $\pi N \rightarrow \pi N$

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

−25	ARNDT	04	DPWA	$\pi N \rightarrow \pi N, \eta N$
−44	ARNDT	95	DPWA	$\pi N \rightarrow N\pi$
−37	ARNDT	91	DPWA	$\pi N \rightarrow \pi N$ 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**

<u>$\Gamma(N\pi)/\Gamma_{\text{total}}$</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	<u>Γ_1/Γ</u>
0.05 to 0.15 OUR ESTIMATE				
0.089 ± 0.001	ARNDT	06	DPWA $\pi N \rightarrow \pi N, \eta N$	
0.10 ± 0.02	CUTKOSKY	80	IPWA $\pi N \rightarrow \pi N$	
0.10 ± 0.02	HOEHLER	79	IPWA $\pi N \rightarrow \pi N$	
0.09 ± 0.02	HENDRY	78	MPWA $\pi N \rightarrow \pi N$	
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.110 ± 0.004	ARNDT	04	DPWA $\pi N \rightarrow \pi N, \eta N$	
0.10	ARNDT	95	DPWA $\pi N \rightarrow N\pi$	

$(\Gamma_i \Gamma_f)^{1/2} / \Gamma_{\text{total}}$ 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 <i>et al.</i>	(GWU)
PDG	06	JPG 33 1	W.-M. Yao <i>et al.</i>	(PDG Collab.)
ARNDT	04	PR C69 035213	R.A. Arndt <i>et al.</i>	(GWU, TRIU)
ARNDT	95	PR C52 2120	R.A. Arndt <i>et al.</i>	(VPI, BRCO)
HOEHLER	93	πN Newsletter 9 1	G. Hohler	(KARL)
ARNDT	91	PR D43 2131	R.A. Arndt <i>et al.</i>	(VPI, TELE) IJP
BELL	83	NP B222 389	K.W. Bell <i>et al.</i>	(RL) IJP
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) IJP
SAXON	80	NP B162 522	D.H. Saxon <i>et al.</i>	(RHEL, BRIS) IJP
HOEHLER	79	PDAT 12-1	G. Hohler <i>et al.</i>	(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)