$N(2220)\ 9/2^+$

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

Older and obsolete values are listed and referenced in the 2014 edition, Chinese Physics C **38** 070001 (2014).

N(2220) POLE POSITION

REAL PART

VALUE (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
2130 to 2200 (≈ 2170) OUR ESTIMATE				
2127± 3±24	[1] SVARC	14	L+P	$\pi N \to \pi N$
2150±35	ANISOVICH	12A	DPWA	Multichannel
2199	ARNDT	06	DPWA	$\pi N \to \pi N, \eta N$
2135	HOEHLER	93	ARGD	$\pi N \to \pi N$
2160±80	CUTKOSKY	80	IPWA	$\pi N \to \pi N$

−2×IMAGINARY PART

VALUE (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
400 to 560 (≈ 480) OUR ESTIMATE				
380± 7±22	[1] SVARC	14	L+P	$\pi N \to \pi N$
440± 40	ANISOVICH	12A	DPWA	Multichannel
372	ARNDT	06	DPWA	$\pi N \to \pi N, \eta N$
400	HOEHLER	93	ARGD	$\pi N \to \pi N$
480±100	CUTKOSKY	80	IPWA	$\pi N \to \pi N$

N(2220) ELASTIC POLE RESIDUE

MODULUS $|r|$

VALUE (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
35 to 60 (≈ 45) OUR ESTIMATE				
38± 1±5	[1] SVARC	14	L+P	$\pi N \to \pi N$
60±12	ANISOVICH	12A	DPWA	Multichannel
33	ARNDT	06	DPWA	$\pi N \to \pi N, \eta N$
40	HOEHLER	93	ARGD	$\pi N \to \pi N$
45±20	CUTKOSKY	80	IPWA	$\pi N \to \pi N$

PHASE θ

VALUE (°)	*DOCUMENT ID*		*TECN*	*COMMENT*
−35 to −60 (≈ −50) OUR ESTIMATE				
−52± 1±14	[1] SVARC	14	L+P	$\pi N \to \pi N$
−58±12	ANISOVICH	12A	DPWA	Multichannel
−33	ARNDT	06	DPWA	$\pi N \to \pi N, \eta N$
−50	HOEHLER	93	ARGD	$\pi N \to \pi N$
−45±25	CUTKOSKY	80	IPWA	$\pi N \to \pi N$

N(2220) BREIT-WIGNER MASS

VALUE (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
2200 to 2300 (≈ 2250) OUR ESTIMATE				
2316.3± 2.9	ARNDT	06	DPWA	$\pi N \to \pi N, \eta N$
2230 ±80	CUTKOSKY	80	IPWA	$\pi N \to \pi N$
2205 ±10	HOEHLER	79	IPWA	$\pi N \to \pi N$

N(2220) BREIT-WIGNER WIDTH

VALUE (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
350 to 500 (≈ 400) OUR ESTIMATE				
633± 17	ARNDT	06	DPWA	$\pi N \rightarrow \pi N, \eta N$
500±150	CUTKOSKY	80	IPWA	$\pi N \rightarrow \pi N$
365± 30	HOEHLER	79	IPWA	$\pi N \rightarrow \pi N$

N(2220) DECAY MODES

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

	Mode	Fraction (Γ_i/Γ)
Γ_1	$N\pi$	15–25 %

N(2220) BRANCHING RATIOS

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

VALUE (%)	*DOCUMENT ID*		*TECN*	*COMMENT*
15 to 25 OUR ESTIMATE				
24 ±5	ANISOVICH	12A	DPWA	Multichannel
24.6±0.1	ARNDT	06	DPWA	$\pi N \rightarrow \pi N, \eta N$
15 ±3	CUTKOSKY	80	IPWA	$\pi N \rightarrow \pi N$
18.0±1.5	HOEHLER	79	IPWA	$\pi N \rightarrow \pi N$

N(2220) FOOTNOTES

[1] Fit to the amplitudes of HOEHLER 79.

N(2220) REFERENCES

For early references, see Physics Letters **111B** 1 (1982).

PDG	14	CPC 38 070001	K. Olive *et al.*	(PDG Collab.)
SVARC	14	PR C89 045205	A. Svarc *et al.*	
ANISOVICH	12A	EPJ A48 15	A.V. Anisovich *et al.*	(BONN, PNPI)
ARNDT	06	PR C74 045205	R.A. Arndt *et al.*	(GWU)
HOEHLER	93	πN Newsletter 9 1	G. Hohler	(KARL)
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
HOEHLER	79	PDAT 12-1	G. Hohler *et al.*	(KARLT) IJP
Also		Toronto Conf. 3	R. Koch	(KARLT) IJP