$N(2120)\ 3/2^-$

$I(J^P) = \frac{1}{2}(\frac{3}{2}^-)$ Status: ∗∗

OMITTED FROM SUMMARY TABLE

Before the 2012 *Review*, all the evidence for a $J^P = 3/2^-$ state with a mass above 1800 MeV was filed under a two-star $N(2080)$. There is now evidence from ANISOVICH 12A for two $3/2^-$ states in this region, so we have split the older data (according to mass) between a three-star $N(1875)$ and a two-star $N(2120)$.

N(2120) BREIT-WIGNER MASS

VALUE (MeV)	DOCUMENT ID		TECN	COMMENT
2120 OUR ESTIMATE				
2150±60	ANISOVICH	12A	DPWA	Multichannel
2060±80	[1] CUTKOSKY	80	IPWA	$\pi N \to \pi N$
2081±20	HOEHLER	79	IPWA	$\pi N \to \pi N$

N(2120) BREIT-WIGNER WIDTH

VALUE (MeV)	DOCUMENT ID		TECN	COMMENT
330± 45	ANISOVICH	12A	DPWA	Multichannel
300±100	CUTKOSKY	80	IPWA	$\pi N \to \pi N$ (higher m)
265± 40	HOEHLER	79	IPWA	$\pi N \to \pi N$

N(2120) POLE POSITION

REAL PART

VALUE (MeV)	DOCUMENT ID		TECN	COMMENT
2110±50	ANISOVICH	12A	DPWA	Multichannel
2050±70	CUTKOSKY	80	IPWA	$\pi N \to \pi N$ (higher m)

−2×IMAGINARY PART

VALUE (MeV)	DOCUMENT ID		TECN	COMMENT
340±45	ANISOVICH	12A	DPWA	Multichannel
200±80	CUTKOSKY	80	IPWA	$\pi N \to \pi N$ (higher m)

N(2120) ELASTIC POLE RESIDUE

MODULUS $|r|$

VALUE (MeV)	DOCUMENT ID		TECN	COMMENT
13± 3	ANISOVICH	12A	DPWA	Multichannel
30±20	CUTKOSKY	80	IPWA	$\pi N \to \pi N$ (higher m)

PHASE θ

VALUE (°)	DOCUMENT ID		TECN	COMMENT
−20± 10	ANISOVICH	12A	DPWA	Multichannel
0±100	CUTKOSKY	80	IPWA	$\pi N \to \pi N$ (higher m)

N(2120) INELASTIC POLE RESIDUE

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

Normalized residue in $N\pi \rightarrow N(2120) \rightarrow \Lambda K$

MODULUS (%)	*PHASE (°)*	*DOCUMENT ID*		*TECN*	*COMMENT*
3±1	100 ± 30	ANISOVICH	12A	DPWA	Multichannel

Normalized residue in $N\pi \rightarrow N(2120) \rightarrow \Sigma K$

MODULUS (%)	*PHASE (°)*	*DOCUMENT ID*		*TECN*	*COMMENT*
2±1.5	−50 ± 40	ANISOVICH	12A	DPWA	Multichannel

N(2120) DECAY MODES

	Mode
Γ_1	$N\pi$

N(2120) BRANCHING RATIOS

$\Gamma(N\pi)/\Gamma_{total}$ — Γ_1/Γ

VALUE (%)	*DOCUMENT ID*		*TECN*	*COMMENT*
6±2	ANISOVICH	12A	DPWA	Multichannel
14±7	CUTKOSKY	80	IPWA	$\pi N \rightarrow \pi N$ (higher *m*)
6±2	HOEHLER	79	IPWA	$\pi N \rightarrow \pi N$

N(2120) PHOTON DECAY AMPLITUDES

N(2120) → $p\gamma$, helicity-1/2 amplitude $A_{1/2}$

VALUE	*DOCUMENT ID*		*TECN*	*COMMENT*
0.125±0.045	[2] ANISOVICH	12A	DPWA	Phase = (−55 ± 20)°

N(2120) → $p\gamma$, helicity-3/2 amplitude $A_{3/2}$

VALUE	*DOCUMENT ID*		*TECN*	*COMMENT*
0.150±0.060	[2] ANISOVICH	12A	DPWA	Phase = (−35 ± 15)°

N(2120) FOOTNOTES

[1] CUTKOSKY 80 finds a lower mass D_{13} resonance, as well as one in this region. Both are listed here.

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

N(2120) REFERENCES

ANISOVICH	12A	EPJ A48 15	A.V. Anisovich *et al.*	(BONN, PNPI)
CUTKOSKY	80	Toronto Conf. 19	R.E. Cutkosky *et al.*	(CMU, LBL)
HOEHLER	79	PDAT 12-1	G. Hohler *et al.*	(KARLT)