$\Delta(2420)\ 11/2^+$

$I(J^P) = \frac{3}{2}(\frac{11}{2}^+)$ Status: ****

Older and obsolete values are listed and referenced in the 2014 edition, Chinese Physics **C38** 070001 (2014).

Δ(2420) POLE POSITION

REAL PART

VALUE (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
2260 to 2400 (≈ 2330) OUR ESTIMATE				
2454± 4±11	[1] SVARC	14	L+P	$\pi N \to \pi N$
2529	ARNDT	06	DPWA	$\pi N \to \pi N, \eta N$
2300	HOEHLER	93	ARGD	$\pi N \to \pi N$
2360±100	CUTKOSKY	80	IPWA	$\pi N \to \pi N$

−2×IMAGINARY PART

VALUE (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
350 to 750 (≈ 550) OUR ESTIMATE				
462± 8±50	[1] SVARC	14	L+P	$\pi N \to \pi N$
621	ARNDT	06	DPWA	$\pi N \to \pi N, \eta N$
620	HOEHLER	93	ARGD	$\pi N \to \pi N$
420±100	CUTKOSKY	80	IPWA	$\pi N \to \pi N$

Δ(2420) ELASTIC POLE RESIDUE

MODULUS $|r|$

VALUE (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
20 to 40 (≈ 30) OUR ESTIMATE				
30±1±7	[1] SVARC	14	L+P	$\pi N \to \pi N$
33	ARNDT	06	DPWA	$\pi N \to \pi N, \eta N$
39	HOEHLER	93	ARGD	$\pi N \to \pi N$
18±6	CUTKOSKY	80	IPWA	$\pi N \to \pi N$

PHASE θ

VALUE (°)	*DOCUMENT ID*		*TECN*	*COMMENT*
−60 to 20 (≈ − 20) OUR ESTIMATE				
11± 1±8	[1] SVARC	14	L+P	$\pi N \to \pi N$
−45	ARNDT	06	DPWA	$\pi N \to \pi N, \eta N$
−60	HOEHLER	93	ARGD	$\pi N \to \pi N$
−30±40	CUTKOSKY	80	IPWA	$\pi N \to \pi N$

Δ(2420) BREIT-WIGNER MASS

VALUE (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
2300 to 2500 (≈ 2420) OUR ESTIMATE				
2633± 29	ARNDT	06	DPWA	$\pi N \to \pi N, \eta N$
2400±125	CUTKOSKY	80	IPWA	$\pi N \to \pi N$
2416± 17	HOEHLER	79	IPWA	$\pi N \to \pi N$

Δ(2420) BREIT-WIGNER WIDTH

VALUE (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
300 to 500 (≈ 400) OUR ESTIMATE				
692± 47	ARNDT	06	DPWA	$\pi N \rightarrow \pi N, \eta N$
450±150	CUTKOSKY	80	IPWA	$\pi N \rightarrow \pi N$
340± 28	HOEHLER	79	IPWA	$\pi N \rightarrow \pi N$

Δ(2420) DECAY MODES

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

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

Δ(2420) BRANCHING RATIOS

$\Gamma(N\pi)/\Gamma_{total}$ Γ_1/Γ

VALUE (%)	*DOCUMENT ID*		*TECN*	*COMMENT*
5 to 15 OUR ESTIMATE				
8.5±0.8	ARNDT	06	DPWA	$\pi N \rightarrow \pi N, \eta N$
8 ±3	CUTKOSKY	80	IPWA	$\pi N \rightarrow \pi N$
8.0±1.5	HOEHLER	79	IPWA	$\pi N \rightarrow \pi N$

Δ(2420) FOOTNOTES

[1] Fit to the amplitudes of HOEHLER 79.

Δ(2420) REFERENCES

PDG	14	CP C38 070001	K. Olive *et al.*	(PDG Collab.)
SVARC	14	PR C89 045205	A. Svarc *et al.*	
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)
HOEHLER	79	PDAT 12-1	G. Hohler *et al.*	(KARLT) IJP
Also		Toronto Conf. 3	R. Koch	(KARLT) IJP