$\Delta(2400)\ 9/2^-$

$I(J^P) = \frac{3}{2}(\frac{9}{2}^-)$ Status: **

OMITTED FROM SUMMARY TABLE

Δ(2400) POLE POSITION

REAL PART

VALUE (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
2458± 2	ROENCHEN	22	DPWA	Multichannel
2260±60	CUTKOSKY	80	IPWA	$\pi N \to \pi N$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
1931	ROENCHEN	15A	DPWA	Multichannel
1983	ARNDT	06	DPWA	$\pi N \to \pi N, \eta N$

−2×IMAGINARY PART

VALUE (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
280± 2	ROENCHEN	22	DPWA	Multichannel
320±160	CUTKOSKY	80	IPWA	$\pi N \to \pi N$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
442	ROENCHEN	15A	DPWA	Multichannel
878	ARNDT	06	DPWA	$\pi N \to \pi N, \eta N$

Δ(2400) ELASTIC POLE RESIDUE

MODULUS $|r|$

VALUE (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
5.4±2.7	ROENCHEN	22	DPWA	Multichannel
8 ±4	CUTKOSKY	80	IPWA	$\pi N \to \pi N$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
13	ROENCHEN	15A	DPWA	Multichannel
24	ARNDT	06	DPWA	$\pi N \to \pi N, \eta N$

PHASE θ

VALUE (°)	*DOCUMENT ID*		*TECN*	*COMMENT*
8.4±17	ROENCHEN	22	DPWA	Multichannel
− 25 ±15	CUTKOSKY	80	IPWA	$\pi N \to \pi N$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
− 96	ROENCHEN	15A	DPWA	Multichannel
−139	ARNDT	06	DPWA	$\pi N \to \pi N, \eta N$

Δ(2400) INELASTIC POLE RESIDUE

The "normalized residue" is the residue divided by $\Gamma_{pole}/2$.

Normalized residue in $N\pi \to \Delta(2400) \to \Sigma K$

MODULUS	*PHASE (°)*	*DOCUMENT ID*		*TECN*	*COMMENT*
0.004±0.003	17 ± 15	ROENCHEN	22	DPWA	Multichannel
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.009	25	ROENCHEN	15A	DPWA	Multichannel

Normalized residue in $N\pi \rightarrow \Delta(2400) \rightarrow \Delta\pi$, G-wave

MODULUS	PHASE (°)	DOCUMENT ID		TECN	COMMENT
0.10±0.05	17 ± 11	ROENCHEN	22	DPWA	Multichannel
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.18	−110	ROENCHEN	15A	DPWA	Multichannel

Normalized residue in $N\pi \rightarrow \Delta(2400) \rightarrow \Delta\pi$, I-wave

MODULUS	PHASE (°)	DOCUMENT ID		TECN	COMMENT
0.019±0.003	−120 ± 25	ROENCHEN	22	DPWA	Multichannel
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.012	−1.0	ROENCHEN	15A	DPWA	Multichannel

$\Delta(2400)$ BREIT-WIGNER MASS

VALUE (MeV)	DOCUMENT ID		TECN	COMMENT
2643±141	[1] ARNDT	06	DPWA	$\pi N \rightarrow \pi N, \eta N$
2300±100	CUTKOSKY	80	IPWA	$\pi N \rightarrow \pi N$
2468± 50	HOEHLER	79	IPWA	$\pi N \rightarrow \pi N$

[1] Statistical error only.

$\Delta(2400)$ BREIT-WIGNER WIDTH

VALUE (MeV)	DOCUMENT ID		TECN	COMMENT
895±432	[2] ARNDT	06	DPWA	$\pi N \rightarrow \pi N, \eta N$
330±100	CUTKOSKY	80	IPWA	$\pi N \rightarrow \pi N$
480±100	HOEHLER	79	IPWA	$\pi N \rightarrow \pi N$

[2] Statistical error only.

$\Delta(2400)$ DECAY MODES

	Mode	Fraction (Γ_i/Γ)
Γ_1	$N\pi$	3–9 %

$\Delta(2400)$ BRANCHING RATIOS

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

VALUE (%)	DOCUMENT ID		TECN	COMMENT
6.4±2.2	[3] ARNDT	06	DPWA	$\pi N \rightarrow \pi N, \eta N$
5 ±2	CUTKOSKY	80	IPWA	$\pi N \rightarrow \pi N$
6 ±3	HOEHLER	79	IPWA	$\pi N \rightarrow \pi N$

[3] Statistical error only.

Δ(2400) PHOTON DECAY AMPLITUDES AT THE POLE

Δ(2400) → Nγ, helicity-1/2 amplitude $A_{1/2}$

MODULUS (GeV$^{-1/2}$)	PHASE (°)	DOCUMENT ID		TECN	COMMENT
0.021±0.007	−67 ± 12	ROENCHEN	22	DPWA	Multichannel
• • • We do not use the following data for averages, fits, limits, etc. • • •					
−0.034	63	ROENCHEN	15A	DPWA	Multichannel

Δ(2400) → Nγ, helicity-3/2 amplitude $A_{3/2}$

MODULUS (GeV$^{-1/2}$)	PHASE (°)	DOCUMENT ID		TECN	COMMENT
0.022±0.007	122 ± 7	ROENCHEN	22	DPWA	Multichannel
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.054	−75	ROENCHEN	15A	DPWA	Multichannel

Δ(2400) REFERENCES

ROENCHEN	22	EPJ A58 229	D. Roenchen *et al.*	(JULI, GWU, BONN+)
ROENCHEN	15A	EPJ A51 70	D. Roenchen *et al.*	
ARNDT	06	PR C74 045205	R.A. Arndt *et al.*	(GWU)
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