

$\Delta(2400) 9/2^-$ $I(J^P) = \frac{3}{2}(\frac{9}{2}^-)$ Status: **

OMITTED FROM SUMMARY TABLE

 $\Delta(2400)$ POLE POSITION**REAL PART**

<u>VALUE (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
2260±60	CUTKOSKY 80	IPWA	$\pi N \rightarrow \pi N$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
1931	ROENCHEN 15A	DPWA	Multichannel
1983	ARNDT 06	DPWA	$\pi N \rightarrow \pi N, \eta N$

−2×IMAGINARY PART

<u>VALUE (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
320±160	CUTKOSKY 80	IPWA	$\pi N \rightarrow \pi N$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
442	ROENCHEN 15A	DPWA	Multichannel
878	ARNDT 06	DPWA	$\pi N \rightarrow \pi N, \eta N$

 $\Delta(2400)$ ELASTIC POLE RESIDUE**MODULUS $|r|$**

<u>VALUE (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
8±4	CUTKOSKY 80	IPWA	$\pi N \rightarrow \pi N$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
13	ROENCHEN 15A	DPWA	Multichannel
24	ARNDT 06	DPWA	$\pi N \rightarrow \pi N, \eta N$

PHASE θ

<u>VALUE (°)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
− 25±15	CUTKOSKY 80	IPWA	$\pi N \rightarrow \pi N$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
− 96	ROENCHEN 15A	DPWA	Multichannel
− 139	ARNDT 06	DPWA	$\pi N \rightarrow \pi N, \eta N$

 $\Delta(2400)$ INELASTIC POLE RESIDUEThe “normalized residue” is the residue divided by $\Gamma_{pole}/2$.**Normalized residue in $N\pi \rightarrow \Delta(2400) \rightarrow \Sigma K$**

<u>MODULUS</u>	<u>PHASE (°)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
● ● ● 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

<u>MODULUS</u>	<u>PHASE ($^\circ$)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
0.18	-110	ROENCHEN	15A DPWA	Multichannel

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

<u>MODULUS</u>	<u>PHASE ($^\circ$)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
0.012	-1.0	ROENCHEN	15A DPWA	Multichannel

 $\Delta(2400)$ BREIT-WIGNER MASS

<u>VALUE (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
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	$\pi N \rightarrow \pi N$

¹Statistical error only. **$\Delta(2400)$ BREIT-WIGNER WIDTH**

<u>VALUE (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
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	$\pi N \rightarrow \pi N$

²Statistical error only. **$\Delta(2400)$ DECAY MODES**

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

 $\Delta(2400)$ BRANCHING RATIOS

<u>$\Gamma(N\pi)/\Gamma_{\text{total}}$</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	Γ_1/Γ
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	$\pi N \rightarrow \pi N$	

³Statistical error only. **$\Delta(2400)$ PHOTON DECAY AMPLITUDES AT THE POLE** **$\Delta(2400) \rightarrow N\gamma$, helicity-1/2 amplitude $A_{1/2}$**

<u>MODULUS ($\text{GeV}^{-1/2}$)</u>	<u>PHASE ($^\circ$)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
$-0.128^{+0.046}_{-0.012}$	118^{+24}_{-3}	ROENCHEN	14 DPWA	
-0.034	63	ROENCHEN	15A DPWA	Multichannel

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

$\Delta(2400) \rightarrow N\gamma$, helicity-3/2 amplitude $A_{3/2}$

<u>MODULUS ($\text{GeV}^{-1/2}$)</u>	<u>PHASE ($^\circ$)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
$-0.115^{+0.042}_{-0.024}$	140^{+17}_{-28}	ROENCHEN	14	DPWA
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●				
0.054	-75	ROENCHEN	15A	DPWA Multichannel

$\Delta(2400)$ REFERENCES

ROENCHEN	15A	EPJ A51 70	D. Roenchen <i>et al.</i>	
ROENCHEN	14	EPJ A50 101	D. Roenchen <i>et al.</i>	
Also		EPJ A51 63 (errat.)	D. Roenchen <i>et al.</i>	
ARNDT	06	PR C74 045205	R.A. Arndt <i>et al.</i>	(GWU)
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)
HOEHLER	79	PDAT 12-1	G. Hohler <i>et al.</i>	(KARLT) IJP
Also		Toronto Conf. 3	R. Koch	(KARLT) IJP