

$\Delta(2000) \ 5/2^+$

$I(J^P) = \frac{3}{2}(\frac{5}{2}^+)$ Status: **

OMITTED FROM SUMMARY TABLE

$\Delta(2000)$ POLE POSITION

REAL PART

VALUE (MeV)	DOCUMENT ID	TECN	COMMENT
1998± 4±4	¹ SVARC 14	L+P	$\pi N \rightarrow \pi N$
1976	SHRESTHA 12A	DPWA	Multichannel
2150±100	CUTKOSKY 80	IPWA	$\pi N \rightarrow \pi N$
• • • We do not use the following data for averages, fits, limits, etc. • • •			
1697	VRANA 00	DPWA	Multichannel

¹Fit to the amplitudes of HOEHLER 79.

−2×IMAGINARY PART

VALUE (MeV)	DOCUMENT ID	TECN	COMMENT
404± 10±4	¹ SVARC 14	L+P	$\pi N \rightarrow \pi N$
350±100	CUTKOSKY 80	IPWA	$\pi N \rightarrow \pi N$
• • • We do not use the following data for averages, fits, limits, etc. • • •			
488	SHRESTHA 12A	DPWA	Multichannel
112	VRANA 00	DPWA	Multichannel

¹Fit to the amplitudes of HOEHLER 79.

$\Delta(2000)$ ELASTIC POLE RESIDUE

MODULUS $|r|$

VALUE (MeV)	DOCUMENT ID	TECN	COMMENT
34±1±1	¹ SVARC 14	L+P	$\pi N \rightarrow \pi N$
16±5	CUTKOSKY 80	IPWA	$\pi N \rightarrow \pi N$

¹Fit to the amplitudes of HOEHLER 79.

PHASE θ

VALUE (°)	DOCUMENT ID	TECN	COMMENT
110± 1±3	¹ SVARC 14	L+P	$\pi N \rightarrow \pi N$
150±90	CUTKOSKY 80	IPWA	$\pi N \rightarrow \pi N$

¹Fit to the amplitudes of HOEHLER 79.

$\Delta(2000)$ BREIT-WIGNER MASS

VALUE (MeV)	DOCUMENT ID	TECN	COMMENT
2015± 24	¹ SHRESTHA 12A	DPWA	Multichannel
2200±125	CUTKOSKY 80	IPWA	$\pi N \rightarrow \pi N$
• • • We do not use the following data for averages, fits, limits, etc. • • •			
1724± 61	VRANA 00	DPWA	Multichannel
1752± 32	MANLEY 92	IPWA	$\pi N \rightarrow \pi N \ \& \ N\pi\pi$

¹Statistical error only.

$\Delta(2000)$ BREIT-WIGNER WIDTH

VALUE (MeV)	DOCUMENT ID	TECN	COMMENT
500 ± 52	¹ SHRESTHA	12A	DPWA Multichannel
400 ± 125	CUTKOSKY	80	IPWA $\pi N \rightarrow \pi N$
• • • We do not use the following data for averages, fits, limits, etc. • • •			
138 ± 68	VRANA	00	DPWA Multichannel
251 ± 93	MANLEY	92	IPWA $\pi N \rightarrow \pi N$ & $N \pi \pi$
¹ Statistical error only.			

$\Delta(2000)$ DECAY MODES

Mode	Fraction (Γ_i/Γ)
Γ_1 $N\pi$	3–11 %
Γ_2 $N\pi\pi$	>87 %
Γ_3 $\Delta(1232)\pi$	<9 %
Γ_4 $\Delta(1232)\pi$, <i>P</i> -wave	<6 %
Γ_5 $\Delta(1232)\pi$, <i>F</i> -wave	<3 %
Γ_6 $N\rho$, <i>S</i> =3/2, <i>P</i> -wave	seen
Γ_7 $N\gamma$	
Γ_8 $N\gamma$, helicity=1/2	seen
Γ_9 $N\gamma$, helicity=3/2	seen

$\Delta(2000)$ BRANCHING RATIOS

$\Gamma(N\pi)/\Gamma_{\text{total}}$				Γ_1/Γ
VALUE (%)	DOCUMENT ID	TECN	COMMENT	
7 ± 1	¹ SHRESTHA	12A	DPWA Multichannel	
7 ± 4	CUTKOSKY	80	IPWA $\pi N \rightarrow \pi N$	
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0 ± 1	VRANA	00	DPWA Multichannel	
2 ± 1	MANLEY	92	IPWA $\pi N \rightarrow \pi N$ & $N \pi \pi$	
¹ Statistical error only.				

$\Gamma(\Delta(1232)\pi, P\text{-wave})/\Gamma_{\text{total}}$				Γ_4/Γ
VALUE (%)	DOCUMENT ID	TECN	COMMENT	
3 ± 3	¹ SHRESTHA	12A	DPWA Multichannel	
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0 ± 1	VRANA	00	DPWA Multichannel	
¹ Statistical error only.				

$\Gamma(\Delta(1232)\pi, F\text{-wave})/\Gamma_{\text{total}}$				Γ_5/Γ
VALUE (%)	DOCUMENT ID	TECN	COMMENT	
< 3	SHRESTHA	12A	DPWA Multichannel	
• • • We do not use the following data for averages, fits, limits, etc. • • •				
40 ± 1	VRANA	00	DPWA Multichannel	

$\Gamma(N\rho, S=3/2, P\text{-wave})/\Gamma_{\text{total}}$					Γ_6/Γ
VALUE (%)	DOCUMENT ID	TECN	COMMENT		
90 ± 3	¹ SHRESTHA	12A	DPWA	Multichannel	
• • • We do not use the following data for averages, fits, limits, etc. • • •					
60 ± 60	VRANA	00	DPWA	Multichannel	
¹ Statistical error only.					

$\Delta(2000)$ BREIT-WIGNER PHOTON DECAY AMPLITUDES

$\Delta(2000) \rightarrow p\gamma$, helicity-1/2 amplitude $A_{1/2}$

VALUE ($\text{GeV}^{-1/2}$)	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •			
-0.061 ± 0.018	¹ SHRESTHA	12A	DPWA Multichannel
¹ Statistical error only.			

$\Delta(2000) \rightarrow p\gamma$, helicity-3/2 amplitude $A_{3/2}$

VALUE ($\text{GeV}^{-1/2}$)	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •			
0.158 ± 0.032	¹ SHRESTHA	12A	DPWA Multichannel
¹ Statistical error only.			

$\Delta(2000)$ REFERENCES

SVARC	14	PR C89 045205	A. Svarc <i>et al.</i>	(RBI Zagreb, UNI Tuzla)
SHRESTHA	12A	PR C86 055203	M. Shrestha, D.M. Manley	(KSU)
VRANA	00	PRPL 328 181	T.P. Vrana, S.A. Dytman, T.-S.H. Lee	(PITT, ANL)
MANLEY	92	PR D45 4002	D.M. Manley, E.M. Saleski	(KSA) IJP
Also		PR D30 904	D.M. Manley <i>et al.</i>	(VPI)
CUTKOSKY	80	Toronto Conf. 19	R.E. Cutkosky <i>et al.</i>	(CMU, LBL)
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)