

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

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

OMITTED FROM SUMMARY TABLE

 $\Delta(2000)$ POLE POSITION**REAL PART**

VALUE (MeV)	DOCUMENT ID	TECN	COMMENT
1998 \pm 4 \pm 4	¹ SVARC 14	L+P	$\pi N \rightarrow \pi N$
1976	SHRESTHA 12A	DPWA	Multichannel
2150 \pm 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

¹ Fit to the amplitudes of HOEHLER 79.**−2×IMAGINARY PART**

VALUE (MeV)	DOCUMENT ID	TECN	COMMENT
404 \pm 10 \pm 4	¹ SVARC 14	L+P	$\pi N \rightarrow \pi N$
350 \pm 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

¹ Fit to the amplitudes of HOEHLER 79. **$\Delta(2000)$ ELASTIC POLE RESIDUE****MODULUS $|r|$**

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

¹ Fit to the amplitudes of HOEHLER 79.**PHASE θ**

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

¹ Fit to the amplitudes of HOEHLER 79. **$\Delta(2000)$ BREIT-WIGNER MASS**

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

¹ Statistical error only.

$\Delta(2000)$ BREIT-WIGNER WIDTH

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

¹Statistical 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 $N\rho$, $S=3/2$, <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		
<u>VALUE (%)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
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 $\pi N \rightarrow \pi N$ & $N\pi\pi$

¹Statistical error only.

$\Gamma(\Delta(1232)\pi, P\text{-wave})/\Gamma_{\text{total}}$	Γ_4/Γ		
<u>VALUE (%)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
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

¹Statistical error only.

$\Gamma(\Delta(1232)\pi, F\text{-wave})/\Gamma_{\text{total}}$	Γ_5/Γ		
<u>VALUE (%)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
< 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
-0.061 ± 0.018	¹ SHRESTHA 12A	DPWA	Multichannel
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
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
0.158 ± 0.032	¹ SHRESTHA 12A	DPWA	Multichannel
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
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)