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

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

OMITTED FROM SUMMARY TABLE

$\Delta(2000)$ POLE POSITION

REAL PART

VALUE (MeV)	DOCUMENT ID		TECN	COMMENT
$1998\pm\ \ 4\pm4$	[1] SVARC	14	L+P	$\pi N \to \pi N$
1976	SHRESTHA	12A	DPWA	Multichannel
2150 ± 100	CUTKOSKY	80	IPWA	$\pi N \to \pi N$
• • • 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.

$-2\times$IMAGINARY PART

VALUE (MeV)	DOCUMENT ID		TECN	COMMENT
$404\pm\ 10\pm4$	[1] SVARC	14	L+P	$\pi N \to \pi N$
350 ± 100	CUTKOSKY	80	IPWA	$\pi N \to \pi N$
• • • 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
$34\pm1\pm1$	[1] SVARC	14	L+P	$\pi N \to \pi N$
16 ± 5	CUTKOSKY	80	IPWA	$\pi N \to \pi N$

[1] Fit to the amplitudes of HOEHLER 79.

PHASE θ

VALUE (°)	DOCUMENT ID		TECN	COMMENT
$110\pm\ 1\pm3$	[1] SVARC	14	L+P	$\pi N \to \pi N$
150 ± 90	CUTKOSKY	80	IPWA	$\pi N \to \pi N$

[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 ± 125	CUTKOSKY	80	IPWA	$\pi N \to \pi N$
• • • 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	$\pi N \to \pi N$ & $N\pi\pi$

[1] Statistical 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	$\Delta(1232)\pi$, P-wave	<6 %
Γ_5	$\Delta(1232)\pi$, F-wave	<3 %
Γ_6	$N\rho$, S=3/2, P-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

$\Gamma\left(N\rho, S{=}3/2, P\text{-wave}\right)/\Gamma_{\text{total}}$ $\qquad\qquad\qquad\qquad\qquad$ 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.

Δ(2000) BREIT-WIGNER PHOTON DECAY AMPLITUDES

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

VALUE (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.

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

VALUE (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.

Δ(2000) REFERENCES

SVARC	14	PR C89 045205	A. Svarc *et al.*	(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 *et al.*	(VPI)
CUTKOSKY	80	Toronto Conf. 19	R.E. Cutkosky *et al.*	(CMU, LBL)
Also		PR D20 2839	R.E. Cutkosky *et al.*	(CMU, LBL)
HOEHLER	79	PDAT 12-1	G. Hohler *et al.*	(KARLT)