

$\Delta(2000) F_{35}$ 

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

OMITTED FROM SUMMARY TABLE

The latest GWU analysis (ARNDT 06) finds no evidence for this resonance.

 **$\Delta(2000)$  BREIT-WIGNER MASS**

<u>VALUE (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>\approx 2000</math> OUR ESTIMATE</b>			
1724 $\pm$ 61	VRANA	00	DPWA Multichannel
1752 $\pm$ 32	MANLEY	92	IPWA $\pi N \rightarrow \pi N$ & $N\pi\pi$
2200 $\pm$ 125	CUTKOSKY	80	IPWA $\pi N \rightarrow \pi N$

 **$\Delta(2000)$  BREIT-WIGNER WIDTH**

<u>VALUE (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
138 $\pm$ 68	VRANA	00	DPWA Multichannel
251 $\pm$ 93	MANLEY	92	IPWA $\pi N \rightarrow \pi N$ & $N\pi\pi$
400 $\pm$ 125	CUTKOSKY	80	IPWA $\pi N \rightarrow \pi N$

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

<u>VALUE (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
1697	VRANA	00	DPWA Multichannel
2150 $\pm$ 100	CUTKOSKY	80	IPWA $\pi N \rightarrow \pi N$

**-2xIMAGINARY PART**

<u>VALUE (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
112	VRANA	00	DPWA Multichannel
350 $\pm$ 100	CUTKOSKY	80	IPWA $\pi N \rightarrow \pi N$

 **$\Delta(2000)$  ELASTIC POLE RESIDUE****MODULUS  $|r|$** 

<u>VALUE (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
16 $\pm$ 5	CUTKOSKY	80	IPWA $\pi N \rightarrow \pi N$

**PHASE  $\theta$** 

<u>VALUE (<math>^\circ</math>)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
150 $\pm$ 90	CUTKOSKY	80	IPWA $\pi N \rightarrow \pi N$

## $\Delta(2000)$ DECAY MODES

Mode
$\Gamma_1$ $N\pi$
$\Gamma_2$ $N\pi\pi$
$\Gamma_3$ $\Delta(1232)\pi$ , <i>P</i> -wave
$\Gamma_4$ $\Delta(1232)\pi$ , <i>F</i> -wave
$\Gamma_5$ $N\rho$ , $S=3/2$ , <i>P</i> -wave

## $\Delta(2000)$ BRANCHING RATIOS

$\Gamma(N\pi)/\Gamma_{\text{total}}$	<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	$\Gamma_1/\Gamma$
	0.00±0.01	VRANA	00	DPWA	Multichannel
	0.02±0.01	MANLEY	92	IPWA	$\pi N \rightarrow \pi N$ & $N\pi\pi$
	0.07±0.04	CUTKOSKY	80	IPWA	$\pi N \rightarrow \pi N$
$(\Gamma_i\Gamma_f)^{1/2}/\Gamma_{\text{total}}$ in $N\pi \rightarrow \Delta(2000) \rightarrow \Delta(1232)\pi$ , <i>P</i> -wave	<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	$(\Gamma_1\Gamma_3)^{1/2}/\Gamma$
	+0.07±0.03	MANLEY	92	IPWA	$\pi N \rightarrow \pi N$ & $N\pi\pi$
$\Gamma(\Delta(1232)\pi, P\text{-wave})/\Gamma_{\text{total}}$	<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	$\Gamma_3/\Gamma$
	0.00±0.01	VRANA	00	DPWA	Multichannel
$(\Gamma_i\Gamma_f)^{1/2}/\Gamma_{\text{total}}$ in $N\pi \rightarrow \Delta(2000) \rightarrow \Delta(1232)\pi$ , <i>F</i> -wave	<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	$(\Gamma_1\Gamma_4)^{1/2}/\Gamma$
	+0.09±0.04	MANLEY	92	IPWA	$\pi N \rightarrow \pi N$ & $N\pi\pi$
$\Gamma(\Delta(1232)\pi, F\text{-wave})/\Gamma_{\text{total}}$	<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	$\Gamma_4/\Gamma$
	0.40±0.01	VRANA	00	DPWA	Multichannel
$(\Gamma_i\Gamma_f)^{1/2}/\Gamma_{\text{total}}$ in $N\pi \rightarrow \Delta(2000) \rightarrow N\rho$ , $S=3/2$ , <i>P</i> -wave	<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	$(\Gamma_1\Gamma_5)^{1/2}/\Gamma$
	-0.06±0.01	MANLEY	92	IPWA	$\pi N \rightarrow \pi N$ & $N\pi\pi$
$\Gamma(N\rho, S=3/2, P\text{-wave})/\Gamma_{\text{total}}$	<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	$\Gamma_5/\Gamma$
	0.60±0.60	VRANA	00	DPWA	Multichannel

## $\Delta(2000)$ REFERENCES

ARNDT	06	PR C74 045205	R.A. Arndt <i>et al.</i>	(GWU)
VRANA	00	PRPL 328 181	T.P. Vrana, S.A. Dytman., T.-S.H. Lee	(PITT+)
MANLEY	92	PR D45 4002	D.M. Manley, E.M. Saleski	(KENT) 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)