

$\Delta(2000) F_{35}$

$I(J^P) = \frac{3}{2}(\frac{5}{2}^+)$ 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> |
|---|--------------------|-------------|--|
| ≈ 2000 OUR ESTIMATE | | | |
| 1724 ± 61 | VRANA | 00 | DPWA Multichannel |
| 1752 ± 32 | MANLEY | 92 | IPWA $\pi N \rightarrow \pi N$ & $N\pi\pi$ |
| 2200 ± 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 ± 68 | VRANA | 00 | DPWA Multichannel |
| 251 ± 93 | MANLEY | 92 | IPWA $\pi N \rightarrow \pi N$ & $N\pi\pi$ |
| 400 ± 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 ± 100 | CUTKOSKY | 80 | IPWA $\pi N \rightarrow \pi N$ |

-2×IMAGINARY PART

| <u>VALUE (MeV)</u> | <u>DOCUMENT ID</u> | <u>TECN</u> | <u>COMMENT</u> |
|--------------------|--------------------|-------------|--------------------------------|
| 112 | VRANA | 00 | DPWA Multichannel |
| 350 ± 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 ± 5 | CUTKOSKY | 80 | IPWA $\pi N \rightarrow \pi N$ |

PHASE θ

| <u>VALUE (°)</u> | <u>DOCUMENT ID</u> | <u>TECN</u> | <u>COMMENT</u> |
|------------------|--------------------|-------------|--------------------------------|
| 150 ± 90 | CUTKOSKY | 80 | IPWA $\pi N \rightarrow \pi N$ |

$\Delta(2000)$ DECAY MODES

| Mode |
|---|
| Γ_1 $N\pi$ |
| Γ_2 $N\pi\pi$ |
| Γ_3 $\Delta(1232)\pi$, <i>P</i> -wave |
| Γ_4 $\Delta(1232)\pi$, <i>F</i> -wave |
| Γ_5 $N\rho$, $S=3/2$, <i>P</i> -wave |

$\Delta(2000)$ BRANCHING RATIOS

| $\Gamma(N\pi)/\Gamma_{\text{total}}$ | <i>DOCUMENT ID</i> | <i>TECN</i> | <i>COMMENT</i> | Γ_1/Γ |
|--|--------------------|-------------|----------------|---------------------------------------|
| 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 $(\Gamma_1\Gamma_3)^{1/2}/\Gamma$ | | | | |
| <i>VALUE</i> | <i>DOCUMENT ID</i> | <i>TECN</i> | <i>COMMENT</i> | |
| +0.07±0.03 | MANLEY | 92 | IPWA | $\pi N \rightarrow \pi N$ & $N\pi\pi$ |
| $\Gamma(\Delta(1232)\pi, P\text{-wave})/\Gamma_{\text{total}}$ Γ_3/Γ | | | | |
| <i>VALUE</i> | <i>DOCUMENT ID</i> | <i>TECN</i> | <i>COMMENT</i> | |
| 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 $(\Gamma_1\Gamma_4)^{1/2}/\Gamma$ | | | | |
| <i>VALUE</i> | <i>DOCUMENT ID</i> | <i>TECN</i> | <i>COMMENT</i> | |
| +0.09±0.04 | MANLEY | 92 | IPWA | $\pi N \rightarrow \pi N$ & $N\pi\pi$ |
| $\Gamma(\Delta(1232)\pi, F\text{-wave})/\Gamma_{\text{total}}$ Γ_4/Γ | | | | |
| <i>VALUE</i> | <i>DOCUMENT ID</i> | <i>TECN</i> | <i>COMMENT</i> | |
| 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 $(\Gamma_1\Gamma_5)^{1/2}/\Gamma$ | | | | |
| <i>VALUE</i> | <i>DOCUMENT ID</i> | <i>TECN</i> | <i>COMMENT</i> | |
| -0.06±0.01 | MANLEY | 92 | IPWA | $\pi N \rightarrow \pi N$ & $N\pi\pi$ |
| $\Gamma(N\rho, S=3/2, P\text{-wave})/\Gamma_{\text{total}}$ Γ_5/Γ | | | | |
| <i>VALUE</i> | <i>DOCUMENT ID</i> | <i>TECN</i> | <i>COMMENT</i> | |
| 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) |