

# N(2000) F<sub>15</sub>

$$I(J^P) = \frac{1}{2}(\frac{5}{2}^+) \text{ Status: } **$$

## OMITTED FROM SUMMARY TABLE

Older results have been retained simply because there is little information at all about this possible state.

### N(2000) BREIT-WIGNER MASS

| <u>VALUE (MeV)</u>  | <u>DOCUMENT ID</u>    | <u>TECN</u> | <u>COMMENT</u>                                 |
|---|-----------------------|-------------|--|
| <b>≈ 2000 OUR ESTIMATE</b>  |                       |             |  |
| 1817.7  | ARNDT                 | 06          | DPWA $\pi N \rightarrow \pi N, \eta N$         |
| 1903 ± 87   | MANLEY                | 92          | IPWA $\pi N \rightarrow \pi N \& N\pi\pi$      |
| 1882 ± 10   | HOEHLER               | 79          | IPWA $\pi N \rightarrow \pi N$                 |
| 2025  | AYED                  | 76          | IPWA $\pi N \rightarrow \pi N$                 |
| 1970  | <sup>1</sup> LANGBEIN | 73          | IPWA $\pi N \rightarrow \Sigma K$ (sol. 2)     |
| 2175  | ALMEHED               | 72          | IPWA $\pi N \rightarrow \pi N$                 |
| 1930  | DEANS                 | 72          | MPWA $\gamma p \rightarrow \Lambda K$ (sol. D) |
| ● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ● |                       |             |  |
| 1814  | ARNDT                 | 95          | DPWA $\pi N \rightarrow N\pi$                  |

### N(2000) BREIT-WIGNER WIDTH

| <u>VALUE (MeV)</u>  | <u>DOCUMENT ID</u>    | <u>TECN</u> | <u>COMMENT</u>                                 |
|---|-----------------------|-------------|--|
| 117.6   | ARNDT                 | 06          | DPWA $\pi N \rightarrow \pi N, \eta N$         |
| 490 ± 310   | MANLEY                | 92          | IPWA $\pi N \rightarrow \pi N \& N\pi\pi$      |
| 95 ± 20   | HOEHLER               | 79          | IPWA $\pi N \rightarrow \pi N$                 |
| 157   | AYED                  | 76          | IPWA $\pi N \rightarrow \pi N$                 |
| 170   | <sup>1</sup> LANGBEIN | 73          | IPWA $\pi N \rightarrow \Sigma K$ (sol. 2)     |
| 150   | ALMEHED               | 72          | IPWA $\pi N \rightarrow \pi N$                 |
| 112   | DEANS                 | 72          | MPWA $\gamma p \rightarrow \Lambda K$ (sol. D) |
| ● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ● |                       |             |  |
| 176   | ARNDT                 | 95          | DPWA $\pi N \rightarrow N\pi$                  |

### N(2000) POLE POSITION

#### REAL PART

| <u>VALUE (MeV)</u>  | <u>DOCUMENT ID</u> | <u>TECN</u> | <u>COMMENT</u>                         |
|---|--------------------|-------------|--|
| 1807  | ARNDT              | 06          | DPWA $\pi N \rightarrow \pi N, \eta N$ |
| ● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ● |                    |             |  |
| 1779  | ARNDT              | 04          | DPWA $\pi N \rightarrow \pi N, \eta N$ |

#### −2×IMAGINARY PART

| <u>VALUE (MeV)</u>  | <u>DOCUMENT ID</u> | <u>TECN</u> | <u>COMMENT</u>                         |
|---|--------------------|-------------|--|
| 109   | ARNDT              | 06          | DPWA $\pi N \rightarrow \pi N, \eta N$ |
| ● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ● |                    |             |  |
| 248   | ARNDT              | 04          | DPWA $\pi N \rightarrow \pi N, \eta N$ |

## N(2000) ELASTIC POLE RESIDUE

### MODULUS $|r|$

| <u>VALUE (MeV)</u>  | <u>DOCUMENT ID</u> | <u>TECN</u> | <u>COMMENT</u>                         |
|---|--------------------|-------------|--|
| 60  | ARNDT              | 06          | DPWA $\pi N \rightarrow \pi N, \eta N$ |
| ● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ● |                    |             |  |
| 47  | ARNDT              | 04          | DPWA $\pi N \rightarrow \pi N, \eta N$ |

### PHASE $\theta$

| <u>VALUE (°)</u>  | <u>DOCUMENT ID</u> | <u>TECN</u> | <u>COMMENT</u>                         |
|---|--------------------|-------------|--|
| -67   | ARNDT              | 06          | DPWA $\pi N \rightarrow \pi N, \eta N$ |
| ● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ● |                    |             |  |
| -61   | ARNDT              | 04          | DPWA $\pi N \rightarrow \pi N, \eta N$ |

## N(2000) DECAY MODES

| Mode  |
|---|
| $\Gamma_1$ $N\pi$                           |
| $\Gamma_2$ $N\eta$                          |
| $\Gamma_3$ $\Lambda K$                      |
| $\Gamma_4$ $\Sigma K$                       |
| $\Gamma_5$ $N\pi\pi$                        |
| $\Gamma_6$ $\Delta(1232)\pi, P\text{-wave}$ |
| $\Gamma_7$ $N\rho, S=3/2, P\text{-wave}$    |
| $\Gamma_8$ $N\rho, S=3/2, F\text{-wave}$    |
| $\Gamma_9$ $p\gamma$                        |

## N(2000) BRANCHING RATIOS

| <u><math>\Gamma(N\pi)/\Gamma_{\text{total}}</math></u>                        | <u>DOCUMENT ID</u> | <u>TECN</u> | <u>COMMENT</u>                                | <u><math>\Gamma_1/\Gamma</math></u> |
|---|--------------------|-------------|---|-------------------------------------|
| 0.127   | ARNDT              | 06          | DPWA $\pi N \rightarrow \pi N, \eta N$        |                                     |
| 0.08 $\pm$ 0.05   | MANLEY             | 92          | IPWA $\pi N \rightarrow \pi N \ \& \ N\pi\pi$ |                                     |
| 0.04 $\pm$ 0.02   | HOEHLER            | 79          | IPWA $\pi N \rightarrow \pi N$                |                                     |
| 0.08  | AYED               | 76          | IPWA $\pi N \rightarrow \pi N$                |                                     |
| 0.25  | ALMEHED            | 72          | IPWA $\pi N \rightarrow \pi N$                |                                     |
| ● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ● |                    |             |   |                                     |
| 0.10  | ARNDT              | 95          | DPWA $\pi N \rightarrow N\pi$                 |                                     |

| <u><math>(\Gamma_j\Gamma_f)^{1/2}/\Gamma_{\text{total}}</math> in <math>N\pi \rightarrow N(2000) \rightarrow N\eta</math></u> | <u>DOCUMENT ID</u> | <u>TECN</u> | <u>COMMENT</u>                   | <u><math>(\Gamma_1\Gamma_2)^{1/2}/\Gamma</math></u> |
|---|--------------------|-------------|----------------------------------|---|
| +0.03   | BAKER              | 79          | DPWA $\pi^- p \rightarrow n\eta$ |   |

| <u><math>(\Gamma_j\Gamma_f)^{1/2}/\Gamma_{\text{total}}</math> in <math>N\pi \rightarrow N(2000) \rightarrow \Lambda K</math></u> | <u>DOCUMENT ID</u> | <u>TECN</u> | <u>COMMENT</u>                         | <u><math>(\Gamma_1\Gamma_3)^{1/2}/\Gamma</math></u> |
|---|--------------------|-------------|--|---|
| not seen  | SAXON              | 80          | DPWA $\pi^- p \rightarrow \Lambda K^0$ |   |

$(\Gamma_i \Gamma_f)^{1/2} / \Gamma_{\text{total}}$  in  $N\pi \rightarrow N(2000) \rightarrow \Sigma K$   $(\Gamma_1 \Gamma_4)^{1/2} / \Gamma$

| VALUE | DOCUMENT ID              | TECN | COMMENT                               |
|-------|--------------------------|------|---------------------------------------|
| 0.022 | <sup>2</sup> DEANS 75    | DPWA | $\pi N \rightarrow \Sigma K$          |
| 0.05  | <sup>1</sup> LANGBEIN 73 | IPWA | $\pi N \rightarrow \Sigma K$ (sol. 2) |

$(\Gamma_i \Gamma_f)^{1/2} / \Gamma_{\text{total}}$  in  $N\pi \rightarrow N(2000) \rightarrow \Delta(1232)\pi$ , *P*-wave  $(\Gamma_1 \Gamma_6)^{1/2} / \Gamma$

| VALUE        | DOCUMENT ID | TECN | COMMENT                               |
|--------------|-------------|------|---------------------------------------|
| +0.10 ± 0.06 | MANLEY 92   | IPWA | $\pi N \rightarrow \pi N$ & $N\pi\pi$ |

$(\Gamma_i \Gamma_f)^{1/2} / \Gamma_{\text{total}}$  in  $N\pi \rightarrow N(2000) \rightarrow N\rho$ , *S*=3/2, *P*-wave  $(\Gamma_1 \Gamma_7)^{1/2} / \Gamma$

| VALUE        | DOCUMENT ID | TECN | COMMENT                               |
|--------------|-------------|------|---------------------------------------|
| -0.22 ± 0.08 | MANLEY 92   | IPWA | $\pi N \rightarrow \pi N$ & $N\pi\pi$ |

$(\Gamma_i \Gamma_f)^{1/2} / \Gamma_{\text{total}}$  in  $N\pi \rightarrow N(2000) \rightarrow N\rho$ , *S*=3/2, *F*-wave  $(\Gamma_1 \Gamma_8)^{1/2} / \Gamma$

| VALUE        | DOCUMENT ID | TECN | COMMENT                               |
|--------------|-------------|------|---------------------------------------|
| +0.11 ± 0.06 | MANLEY 92   | IPWA | $\pi N \rightarrow \pi N$ & $N\pi\pi$ |

$(\Gamma_i \Gamma_f)^{1/2} / \Gamma_{\text{total}}$  in  $p\gamma \rightarrow N(2000) \rightarrow \Lambda K$   $(\Gamma_9 \Gamma_3)^{1/2} / \Gamma$

| VALUE  | DOCUMENT ID | TECN | COMMENT                                   |
|--------|-------------|------|---|
| 0.0022 | DEANS 72    | MPWA | $\gamma p \rightarrow \Lambda K$ (sol. D) |

***N*(2000) FOOTNOTES**

<sup>1</sup> Not seen in solution 1 of LANGBEIN 73.

<sup>2</sup> Value given is from solution 1 of DEANS 75; not present in solutions 2, 3, or 4.

***N*(2000) REFERENCES**

|             |                   |                           |                  |
|-------------|-------------------|---------------------------|------------------|
| ARNDT 06    | PR C74 045205     | R.A. Arndt <i>et al.</i>  | (GWU)            |
| ARNDT 04    | PR C69 035213     | R.A. Arndt <i>et al.</i>  | (GWU, TRIU)      |
| ARNDT 95    | PR C52 2120       | R.A. Arndt <i>et al.</i>  | (VPI, BRCO)      |
| 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)            |
| SAXON 80    | NP B162 522       | D.H. Saxon <i>et al.</i>  | (RHEL, BRIS) IJP |
| BAKER 79    | NP B156 93        | R.D. Baker <i>et al.</i>  | (RHEL) IJP       |
| HOEHLER 79  | PDAT 12-1         | G. Hohler <i>et al.</i>   | (KARLT) IJP      |
| Also        | Toronto Conf. 3   | R. Koch                   | (KARLT) IJP      |
| AYED 76     | Thesis CEA-N-1921 | R. Ayed                   | (SACL) IJP       |
| DEANS 75    | NP B96 90         | S.R. Deans <i>et al.</i>  | (SFLA, ALAH) IJP |
| LANGBEIN 73 | NP B53 251        | W. Langbein, F. Wagner    | (MUNI) IJP       |
| ALMEHED 72  | NP B40 157        | S. Almed, C. Lovelace     | (LUND, RUTG) IJP |
| DEANS 72    | PR D6 1906        | S.R. Deans <i>et al.</i>  | (SFLA) IJP       |