

$N(2250) G_{19}$

$$I(J^P) = \frac{1}{2}(\frac{9}{2}^-) \text{ Status: } ****$$

Some obsolete results published before 1980 were last included in our 2006 edition, Journal of Physics, G **33** 1 (2006).

$N(2250)$ BREIT-WIGNER MASS

| <u>VALUE (MeV)</u> | <u>DOCUMENT ID</u> | <u>TECN</u> | <u>COMMENT</u> |
|---|--------------------|-------------|--|
| 2200 to 2350 (\approx 2275) OUR ESTIMATE | | | |
| 2302 \pm 6 | ARNDT | 06 | DPWA $\pi N \rightarrow \pi N, \eta N$ |
| 2250 \pm 80 | CUTKOSKY | 80 | IPWA $\pi N \rightarrow \pi N$ |
| 2268 \pm 15 | HOEHLER | 79 | IPWA $\pi N \rightarrow \pi N$ |
| 2200 \pm 100 | HENDRY | 78 | MPWA $\pi N \rightarrow \pi N$ |
| ● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ● | | | |
| 2376 \pm 43 | ARNDT | 04 | DPWA $\pi N \rightarrow \pi N, \eta N$ |
| 2291 | ARNDT | 95 | DPWA $\pi N \rightarrow N\pi$ |

$N(2250)$ BREIT-WIGNER WIDTH

| <u>VALUE (MeV)</u> | <u>DOCUMENT ID</u> | <u>TECN</u> | <u>COMMENT</u> |
|---|--------------------|-------------|--|
| 230 to 800 (\approx 500) OUR ESTIMATE | | | |
| 628 \pm 28 | ARNDT | 06 | DPWA $\pi N \rightarrow \pi N, \eta N$ |
| 480 \pm 120 | CUTKOSKY | 80 | IPWA $\pi N \rightarrow \pi N$ |
| 300 \pm 40 | HOEHLER | 79 | IPWA $\pi N \rightarrow \pi N$ |
| 350 \pm 100 | HENDRY | 78 | MPWA $\pi N \rightarrow \pi N$ |
| ● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ● | | | |
| 924 \pm 178 | ARNDT | 04 | DPWA $\pi N \rightarrow \pi N, \eta N$ |
| 772 | ARNDT | 95 | DPWA $\pi N \rightarrow N\pi$ |

$N(2250)$ POLE POSITION

REAL PART

| <u>VALUE (MeV)</u> | <u>DOCUMENT ID</u> | <u>TECN</u> | <u>COMMENT</u> |
|---|----------------------|-------------|--|
| 2150 to 2250 (\approx 2200) OUR ESTIMATE | | | |
| 2217 | ARNDT | 06 | DPWA $\pi N \rightarrow \pi N, \eta N$ |
| 2187 | ¹ HOEHLER | 93 | SPED $\pi N \rightarrow \pi N$ |
| 2150 \pm 50 | CUTKOSKY | 80 | IPWA $\pi N \rightarrow \pi N$ |
| ● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ● | | | |
| 2238 | ARNDT | 04 | DPWA $\pi N \rightarrow \pi N, \eta N$ |
| 2087 | ARNDT | 95 | DPWA $\pi N \rightarrow N\pi$ |
| 2243 | ARNDT | 91 | DPWA $\pi N \rightarrow \pi N$ Soln SM90 |

-2xIMAGINARY PART

| <u>VALUE (MeV)</u> | <u>DOCUMENT ID</u> | <u>TECN</u> | <u>COMMENT</u> |
|---|----------------------|-------------|--|
| 350 to 550 (\approx 450) OUR ESTIMATE | | | |
| 431 | ARNDT | 06 | DPWA $\pi N \rightarrow \pi N, \eta N$ |
| 388 | ¹ HOEHLER | 93 | SPED $\pi N \rightarrow \pi N$ |
| 360 \pm 100 | CUTKOSKY | 80 | IPWA $\pi N \rightarrow \pi N$ |

• • • We do not use the following data for averages, fits, limits, etc. • • •

| | | | | |
|-----|-------|----|------|-------------------------------------|
| 536 | ARNDT | 04 | DPWA | $\pi N \rightarrow \pi N, \eta N$ |
| 680 | ARNDT | 95 | DPWA | $\pi N \rightarrow N\pi$ |
| 650 | ARNDT | 91 | DPWA | $\pi N \rightarrow \pi N$ Soln SM90 |

***N*(2250) ELASTIC POLE RESIDUE**

MODULUS $|r|$

| <u>VALUE (MeV)</u> | <u>DOCUMENT ID</u> | <u>TECN</u> | <u>COMMENT</u> |
|--------------------|--------------------|-------------|--|
| 21 | ARNDT | 06 | DPWA $\pi N \rightarrow \pi N, \eta N$ |
| 21 | HOEHLER | 93 | SPED $\pi N \rightarrow \pi N$ |
| 20±6 | CUTKOSKY | 80 | IPWA $\pi N \rightarrow \pi N$ |

• • • We do not use the following data for averages, fits, limits, etc. • • •

| | | | | |
|----|-------|----|------|-------------------------------------|
| 33 | ARNDT | 04 | DPWA | $\pi N \rightarrow \pi N, \eta N$ |
| 24 | ARNDT | 95 | DPWA | $\pi N \rightarrow N\pi$ |
| 47 | ARNDT | 91 | DPWA | $\pi N \rightarrow \pi N$ Soln SM90 |

PHASE θ

| <u>VALUE (°)</u> | <u>DOCUMENT ID</u> | <u>TECN</u> | <u>COMMENT</u> |
|------------------|--------------------|-------------|--|
| -20 | ARNDT | 06 | DPWA $\pi N \rightarrow \pi N, \eta N$ |
| -50±20 | CUTKOSKY | 80 | IPWA $\pi N \rightarrow \pi N$ |

• • • We do not use the following data for averages, fits, limits, etc. • • •

| | | | | |
|-----|-------|----|------|-------------------------------------|
| -25 | ARNDT | 04 | DPWA | $\pi N \rightarrow \pi N, \eta N$ |
| -44 | ARNDT | 95 | DPWA | $\pi N \rightarrow N\pi$ |
| -37 | ARNDT | 91 | DPWA | $\pi N \rightarrow \pi N$ Soln SM90 |

***N*(2250) DECAY MODES**

The following branching fractions are our estimates, not fits or averages.

| Mode | Fraction (Γ_i/Γ) |
|------------------------|--------------------------------|
| Γ_1 $N\pi$ | 5-15 % |
| Γ_2 $N\eta$ | |
| Γ_3 ΛK | |

***N*(2250) BRANCHING RATIOS**

| <u>$\Gamma(N\pi)/\Gamma_{\text{total}}$</u> | <u>DOCUMENT ID</u> | <u>TECN</u> | <u>COMMENT</u> | <u>Γ_1/Γ</u> |
|---|--------------------|-------------|--|-------------------------------------|
| 0.05 to 0.15 OUR ESTIMATE | | | | |
| 0.089±0.001 | ARNDT | 06 | DPWA $\pi N \rightarrow \pi N, \eta N$ | |
| 0.10 ±0.02 | CUTKOSKY | 80 | IPWA $\pi N \rightarrow \pi N$ | |
| 0.10 ±0.02 | HOEHLER | 79 | IPWA $\pi N \rightarrow \pi N$ | |
| 0.09 ±0.02 | HENDRY | 78 | MPWA $\pi N \rightarrow \pi N$ | |
| • • • We do not use the following data for averages, fits, limits, etc. • • • | | | | |
| 0.110±0.004 | ARNDT | 04 | DPWA $\pi N \rightarrow \pi N, \eta N$ | |
| 0.10 | ARNDT | 95 | DPWA $\pi N \rightarrow N\pi$ | |

| $(\Gamma_i \Gamma_f)^{1/2} / \Gamma_{\text{total}}$ in $N\pi \rightarrow N(2250) \rightarrow \Lambda K$ | | | | $(\Gamma_1 \Gamma_3)^{1/2} / \Gamma$ |
|---|-------------|------|---------|--------------------------------------|
| VALUE | DOCUMENT ID | TECN | COMMENT | |
| -0.02 | BELL | 83 | DPWA | $\pi^- p \rightarrow \Lambda K^0$ |
| not seen | SAXON | 80 | DPWA | $\pi^- p \rightarrow \Lambda K^0$ |

N(2250) FOOTNOTES

¹ See HOEHLER 93 for a detailed discussion of the evidence for and the pole parameters of N and Δ resonances as determined from Argand diagrams of πN elastic partial-wave amplitudes and from plots of the speeds with which the amplitudes traverse the diagrams.

N(2250) REFERENCES

| | | | | |
|----------|----|------------------------|-----------------------------|------------------|
| ARNDT | 06 | PR C74 045205 | R.A. Arndt <i>et al.</i> | (GWU) |
| PDG | 06 | JPG 33 1 | W.-M. Yao <i>et al.</i> | (PDG Collab.) |
| 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) |
| HOEHLER | 93 | πN Newsletter 9 1 | G. Hohler | (KARL) |
| ARNDT | 91 | PR D43 2131 | R.A. Arndt <i>et al.</i> | (VPI, TELE) IJP |
| BELL | 83 | NP B222 389 | K.W. Bell <i>et al.</i> | (RL) IJP |
| CUTKOSKY | 80 | Toronto Conf. 19 | R.E. Cutkosky <i>et al.</i> | (CMU, LBL) IJP |
| Also | | PR D20 2839 | R.E. Cutkosky <i>et al.</i> | (CMU, LBL) IJP |
| SAXON | 80 | NP B162 522 | D.H. Saxon <i>et al.</i> | (RHEL, BRIS) IJP |
| HOEHLER | 79 | PDAT 12-1 | G. Hohler <i>et al.</i> | (KARLT) IJP |
| Also | | Toronto Conf. 3 | R. Koch | (KARLT) IJP |
| HENDRY | 78 | PRL 41 222 | A.W. Hendry | (IND, LBL) IJP |
| Also | | ANP 136 1 | A.W. Hendry | (IND) |