

$N(1520) \ 3/2^-$ $I(J^P) = \frac{1}{2}(3/2^-)$ Status: ****

Older and obsolete values are listed and referenced in the 2014 edition, Chinese Physics **C38** 070001 (2014).

 $N(1520)$ POLE POSITION**REAL PART**

| <u>VALUE (MeV)</u> | <u>DOCUMENT ID</u> | <u>TECN</u> | <u>COMMENT</u> |
|---|--------------------|-------------|--|
| 1505 to 1515 (\approx 1510) OUR ESTIMATE | | | |
| 1507 \pm 2 | SOKHOYAN | 15A | DPWA Multichannel |
| 1506 \pm 1 \pm 1 | ¹ SVARC | 14 | L+P $\pi N \rightarrow \pi N$ |
| 1510 \pm 5 | CUTKOSKY | 80 | IPWA $\pi N \rightarrow \pi N$ |
| ● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ● | | | |
| 1500 | HUNT | 19 | DPWA Multichannel |
| 1512 | ROENCHEN | 15A | DPWA Multichannel |
| 1492 | SHKLYAR | 13 | DPWA Multichannel |
| 1507 \pm 3 | ANISOVICH | 12A | DPWA Multichannel |
| 1506 \pm 9 | BATINIC | 10 | DPWA $\pi N \rightarrow N\pi, N\eta$ |
| 1515 | ARNDT | 06 | DPWA $\pi N \rightarrow \pi N, \eta N$ |
| 1504 | VRANA | 00 | DPWA Multichannel |
| 1510 | HOEHLER | 93 | ARGD $\pi N \rightarrow \pi N$ |

¹Fit to the amplitudes of HOEHLER 79.

-2xIMAGINARY PART

| <u>VALUE (MeV)</u> | <u>DOCUMENT ID</u> | <u>TECN</u> | <u>COMMENT</u> |
|---|--------------------|-------------|--|
| 105 to 120 (\approx 110) OUR ESTIMATE | | | |
| 111 \pm 3 | SOKHOYAN | 15A | DPWA Multichannel |
| 115 \pm 2 \pm 1 | ¹ SVARC | 14 | L+P $\pi N \rightarrow \pi N$ |
| 114 \pm 10 | CUTKOSKY | 80 | IPWA $\pi N \rightarrow \pi N$ |
| ● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ● | | | |
| 117 | HUNT | 19 | DPWA Multichannel |
| 89 | ROENCHEN | 15A | DPWA Multichannel |
| 94 | SHKLYAR | 13 | DPWA Multichannel |
| 111 \pm 5 | ANISOVICH | 12A | DPWA Multichannel |
| 122 \pm 9 | BATINIC | 10 | DPWA $\pi N \rightarrow N\pi, N\eta$ |
| 113 | ARNDT | 06 | DPWA $\pi N \rightarrow \pi N, \eta N$ |
| 112 | VRANA | 00 | DPWA Multichannel |
| 120 | HOEHLER | 93 | ARGD $\pi N \rightarrow \pi N$ |

¹Fit to the amplitudes of HOEHLER 79.

 $N(1520)$ ELASTIC POLE RESIDUE**MODULUS $|r|$**

| <u>VALUE (MeV)</u> | <u>DOCUMENT ID</u> | <u>TECN</u> | <u>COMMENT</u> |
|--|--------------------|-------------|--------------------------------|
| 32 to 38 (\approx 35) OUR ESTIMATE | | | |
| 36 \pm 2 | SOKHOYAN | 15A | DPWA Multichannel |
| 33 \pm 1 \pm 1 | ¹ SVARC | 14 | L+P $\pi N \rightarrow \pi N$ |
| 35 \pm 2 | CUTKOSKY | 80 | IPWA $\pi N \rightarrow \pi N$ |

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

| | | | | |
|------|-----------|-----|------|-----------------------------------|
| 37 | ROENCHEN | 15A | DPWA | Multichannel |
| 27 | SHKLYAR | 13 | DPWA | Multichannel |
| 36±3 | ANISOVICH | 12A | DPWA | Multichannel |
| 35 | BATINIC | 10 | DPWA | $\pi N \rightarrow N\pi, N\eta$ |
| 38 | ARNDT | 06 | DPWA | $\pi N \rightarrow \pi N, \eta N$ |
| 32 | HOEHLER | 93 | ARGD | $\pi N \rightarrow \pi N$ |

¹ Fit to the amplitudes of HOEHLER 79.

PHASE θ

| <u>VALUE (°)</u> | <u>DOCUMENT ID</u> | <u>TECN</u> | <u>COMMENT</u> |
|---------------------------------------|--------------------|-------------|--------------------------------|
| −15 to −5 (≈ −10) OUR ESTIMATE | | | |
| −14±3 | SOKHOYAN | 15A | DPWA Multichannel |
| −15±1±1 | ¹ SVARC | 14 | L+P $\pi N \rightarrow \pi N$ |
| −12±5 | CUTKOSKY | 80 | IPWA $\pi N \rightarrow \pi N$ |

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

| | | | | |
|-------|-----------|-----|------|-----------------------------------|
| −6 | ROENCHEN | 15A | DPWA | Multichannel |
| −35 | SHKLYAR | 13 | DPWA | Multichannel |
| −14±3 | ANISOVICH | 12A | DPWA | Multichannel |
| −7 | BATINIC | 10 | DPWA | $\pi N \rightarrow N\pi, N\eta$ |
| −5 | ARNDT | 06 | DPWA | $\pi N \rightarrow \pi N, \eta N$ |
| −8 | HOEHLER | 93 | ARGD | $\pi N \rightarrow \pi N$ |

¹ Fit to the amplitudes of HOEHLER 79.

N(1520) INELASTIC POLE RESIDUE

The “normalized residue” is the residue divided by $\Gamma_{pole}/2$.

Normalized residue in $N\pi \rightarrow N(1520) \rightarrow \Delta\pi$, S-wave

| <u>MODULUS</u> | <u>PHASE (°)</u> | <u>DOCUMENT ID</u> | <u>TECN</u> | <u>COMMENT</u> |
|---|------------------|--------------------|-------------|-------------------|
| 0.33±0.04 | 155 ± 15 | SOKHOYAN | 15A | DPWA Multichannel |
| • • • We do not use the following data for averages, fits, limits, etc. • • • | | | | |
| 0.33±0.05 | 150 ± 20 | ANISOVICH | 12A | DPWA Multichannel |

Normalized residue in $N\pi \rightarrow N(1520) \rightarrow \Delta\pi$, D-wave

| <u>MODULUS</u> | <u>PHASE (°)</u> | <u>DOCUMENT ID</u> | <u>TECN</u> | <u>COMMENT</u> |
|---|------------------|--------------------|-------------|-------------------|
| 0.25±0.03 | 105 ± 18 | SOKHOYAN | 15A | DPWA Multichannel |
| • • • We do not use the following data for averages, fits, limits, etc. • • • | | | | |
| 0.25±0.03 | 100 ± 20 | ANISOVICH | 12A | DPWA Multichannel |

Normalized residue in $N\pi \rightarrow N(1520) \rightarrow N\eta$

| <u>MODULUS</u> | <u>PHASE (°)</u> | <u>DOCUMENT ID</u> | <u>TECN</u> | <u>COMMENT</u> |
|---|------------------|--------------------|-------------|-------------------|
| • • • We do not use the following data for averages, fits, limits, etc. • • • | | | | |
| 0.026 | 95 | ROENCHEN | 15A | DPWA Multichannel |

Normalized residue in $N\pi \rightarrow N(1520) \rightarrow \Lambda K$

| <u>MODULUS</u> | <u>PHASE (°)</u> | <u>DOCUMENT ID</u> | <u>TECN</u> | <u>COMMENT</u> |
|---|------------------|--------------------|-------------|-------------------|
| • • • We do not use the following data for averages, fits, limits, etc. • • • | | | | |
| 0.069 | 158 | ROENCHEN | 15A | DPWA Multichannel |

Normalized residue in $N\pi \rightarrow N(1520) \rightarrow \Sigma K$

| <u>MODULUS</u> | <u>PHASE ($^\circ$)</u> | <u>DOCUMENT ID</u> | <u>TECN</u> | <u>COMMENT</u> |
|----------------|------------------------------------|--------------------|-------------|----------------|
| 0.049 | -41 | ROENCHEN | 15A DPWA | Multichannel |

Normalized residue in $N\pi \rightarrow N(1520) \rightarrow N\sigma$

| <u>MODULUS</u> | <u>PHASE ($^\circ$)</u> | <u>DOCUMENT ID</u> | <u>TECN</u> | <u>COMMENT</u> |
|-----------------|------------------------------------|--------------------|-------------|----------------|
| 0.08 ± 0.03 | -45 ± 25 | SOKHOYAN | 15A DPWA | Multichannel |

 $N(1520)$ BREIT-WIGNER MASS

| <u>VALUE (MeV)</u> | <u>DOCUMENT ID</u> | <u>TECN</u> | <u>COMMENT</u> |
|---|-----------------------|-------------|-----------------------------------|
| 1510 to 1520 (≈ 1515) OUR ESTIMATE | | | |
| 1512.0 ± 1.5 | ¹ HUNT | 19 DPWA | Multichannel |
| 1516 ± 2 | SOKHOYAN | 15A DPWA | Multichannel |
| 1505 ± 4 | ¹ SHKLYAR | 13 DPWA | Multichannel |
| 1514.5 ± 0.2 | ¹ ARNDT | 06 DPWA | $\pi N \rightarrow \pi N, \eta N$ |
| 1525 ± 10 | CUTKOSKY | 80 IPWA | $\pi N \rightarrow \pi N$ |
| 1519 ± 4 | HOEHLER | 79 IPWA | $\pi N \rightarrow \pi N$ |
| • • • We do not use the following data for averages, fits, limits, etc. • • • | | | |
| 1517 ± 3 | ANISOVICH | 12A DPWA | Multichannel |
| 1512.6 ± 0.5 | ¹ SHRESTHA | 12A DPWA | Multichannel |
| 1522 ± 8 | BATINIC | 10 DPWA | $\pi N \rightarrow N\pi, N\eta$ |
| 1509 ± 1 | PENNER | 02C DPWA | Multichannel |
| 1518 ± 3 | VRANA | 00 DPWA | Multichannel |

¹Statistical error only. **$N(1520)$ BREIT-WIGNER WIDTH**

| <u>VALUE (MeV)</u> | <u>DOCUMENT ID</u> | <u>TECN</u> | <u>COMMENT</u> |
|---|-----------------------|-------------|-----------------------------------|
| 100 to 120 (≈ 110) OUR ESTIMATE | | | |
| 121 ± 3 | ¹ HUNT | 19 DPWA | Multichannel |
| 113 ± 4 | SOKHOYAN | 15A DPWA | Multichannel |
| 100 ± 2 | ¹ SHKLYAR | 13 DPWA | Multichannel |
| 103.6 ± 0.4 | ¹ ARNDT | 06 DPWA | $\pi N \rightarrow \pi N, \eta N$ |
| 120 ± 15 | CUTKOSKY | 80 IPWA | $\pi N \rightarrow \pi N$ |
| 114 ± 7 | HOEHLER | 79 IPWA | $\pi N \rightarrow \pi N$ |
| • • • We do not use the following data for averages, fits, limits, etc. • • • | | | |
| 114 ± 5 | ANISOVICH | 12A DPWA | Multichannel |
| 117 ± 1 | ¹ SHRESTHA | 12A DPWA | Multichannel |
| 132 ± 11 | BATINIC | 10 DPWA | $\pi N \rightarrow N\pi, N\eta$ |
| 100 ± 2 | PENNER | 02C DPWA | Multichannel |
| 124 ± 4 | VRANA | 00 DPWA | Multichannel |

¹Statistical error only.

$N(1520)$ DECAY MODES

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

| Mode | Fraction (Γ_i/Γ) |
|--|--------------------------------|
| Γ_1 $N\pi$ | 55–65 % |
| Γ_2 $N\eta$ | 0.07–0.09 % |
| Γ_3 $N\pi\pi$ | 25–35 % |
| Γ_4 $\Delta(1232)\pi$ | 22–34 % |
| Γ_5 $\Delta(1232)\pi$, S -wave | 15–23 % |
| Γ_6 $\Delta(1232)\pi$, D -wave | 7–11 % |
| Γ_7 $N\rho$ | 10–16 % |
| Γ_8 $N\rho$, $S=3/2$, S -wave | 10–16 % |
| Γ_9 $N\rho$, $S=1/2$, D -wave | 0.2–0.4 % |
| Γ_{10} $N\sigma$ | <10 % |
| Γ_{11} $p\gamma$ | 0.31–0.52 % |
| Γ_{12} $p\gamma$, helicity=1/2 | 0.01–0.02 % |
| Γ_{13} $p\gamma$, helicity=3/2 | 0.30–0.50 % |
| Γ_{14} $n\gamma$ | 0.30–0.53 % |
| Γ_{15} $n\gamma$, helicity=1/2 | 0.04–0.10 % |
| Γ_{16} $n\gamma$, helicity=3/2 | 0.25–0.45 % |

 $N(1520)$ BRANCHING RATIOS

| $\Gamma(N\pi)/\Gamma_{\text{total}}$ | | | | | Γ_1/Γ |
|---|-----------------------|------|---------|-----------------------------------|-------------------|
| VALUE (%) | DOCUMENT ID | TECN | COMMENT | | |
| 55 to 65 (≈ 60) OUR ESTIMATE | | | | | |
| 58.3 ± 1.5 | ¹ HUNT | 19 | DPWA | Multichannel | |
| 61 ± 2 | SOKHOYAN | 15A | DPWA | Multichannel | |
| 57 ± 2 | ¹ SHKLYAR | 13 | DPWA | Multichannel | |
| 63.2 ± 0.1 | ¹ ARNDT | 06 | DPWA | $\pi N \rightarrow \pi N, \eta N$ | |
| 58 ± 3 | CUTKOSKY | 80 | IPWA | $\pi N \rightarrow \pi N$ | |
| 54 ± 3 | HOEHLER | 79 | IPWA | $\pi N \rightarrow \pi N$ | |
| ● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ● | | | | | |
| 62 ± 3 | ANISOVICH | 12A | DPWA | Multichannel | |
| 62.7 ± 0.5 | ¹ SHRESTHA | 12A | DPWA | Multichannel | |
| 55 ± 5 | BATINIC | 10 | DPWA | $\pi N \rightarrow N\pi, N\eta$ | |
| 56 ± 1 | PENNER | 02C | DPWA | Multichannel | |
| 63 ± 2 | VRANA | 00 | DPWA | Multichannel | |

¹Statistical error only.

| $\Gamma(N\eta)/\Gamma_{\text{total}}$ | | | | | Γ_2/Γ |
|---------------------------------------|-------------------|------|---------|------------------------------|-------------------|
| VALUE (%) | DOCUMENT ID | TECN | COMMENT | | |
| <0.1 | MUELLER | 20 | DPWA | Multichannel | |
| 0.03 ± 0.01 | ¹ HUNT | 19 | DPWA | Multichannel | |
| 0.08 ± 0.01 | TIATOR | 99 | DPWA | $\gamma p \rightarrow p\eta$ | |

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

| | | | | |
|--------------|---------|-----|------|---------------------------------|
| <1 | SHKLYAR | 13 | DPWA | Multichannel |
| 0.1 ±0.1 | BATINIC | 10 | DPWA | $\pi N \rightarrow N\pi, N\eta$ |
| 0.2 ±0.1 | THOMA | 08 | DPWA | Multichannel |
| 0.08 to 0.12 | ARNDT | 05 | DPWA | Multichannel |
| 0.23±0.04 | PENNER | 02C | DPWA | Multichannel |
| 0 ±1 | VRANA | 00 | DPWA | Multichannel |

¹Statistical error only.

$\Gamma(\Delta(1232)\pi, S\text{-wave})/\Gamma_{\text{total}}$

Γ_5/Γ

| <u>VALUE (%)</u> | <u>DOCUMENT ID</u> | <u>TECN</u> | <u>COMMENT</u> |
|------------------|----------------------|-------------|----------------|
| 12.1±2.1 | ADAMCZEW... 20 | DPWA | Multichannel |
| 21 ±2 | ¹ HUNT 19 | DPWA | Multichannel |
| 19 ±4 | SOKHOYAN 15A | DPWA | Multichannel |

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

| | | | |
|---------|---------------------------|------|--------------|
| 19 ±4 | ANISOVICH 12A | DPWA | Multichannel |
| 9.3±0.7 | ¹ SHRESTHA 12A | DPWA | Multichannel |
| 15 ±2 | VRANA 00 | DPWA | Multichannel |

¹Statistical error only.

$\Gamma(\Delta(1232)\pi, D\text{-wave})/\Gamma_{\text{total}}$

Γ_6/Γ

| <u>VALUE (%)</u> | <u>DOCUMENT ID</u> | <u>TECN</u> | <u>COMMENT</u> |
|------------------|----------------------|-------------|----------------|
| 6 ±2 | ADAMCZEW... 20 | DPWA | Multichannel |
| 6 ±1 | ¹ HUNT 19 | DPWA | Multichannel |
| 9 ±2 | SOKHOYAN 15A | DPWA | Multichannel |

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

| | | | |
|---------|---------------------------|------|--------------|
| 9 ±2 | ANISOVICH 12A | DPWA | Multichannel |
| 6.3±0.5 | ¹ SHRESTHA 12A | DPWA | Multichannel |
| 11 ±2 | VRANA 00 | DPWA | Multichannel |

¹Statistical error only.

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

Γ_8/Γ

| <u>VALUE (%)</u> | <u>DOCUMENT ID</u> | <u>TECN</u> | <u>COMMENT</u> |
|-------------------------------|----------------------|-------------|----------------|
| 10–16 % OUR EVALUATION | | | |
| 11.8±1.9 | ADAMCZEW... 20 | DPWA | Multichannel |
| 14.1±1.5 | ¹ HUNT 19 | DPWA | Multichannel |

¹Statistical error only

$\Gamma(N\rho, S=1/2, D\text{-wave})/\Gamma_{\text{total}}$

Γ_9/Γ

| <u>VALUE (%)</u> | <u>DOCUMENT ID</u> | <u>TECN</u> | <u>COMMENT</u> |
|---------------------------------|--------------------|-------------|----------------|
| 0.2–0.4 % OUR EVALUATION | | | |
| 0.4±0.2 | ADAMCZEW... 20 | DPWA | Multichannel |

$\Gamma(N\sigma)/\Gamma_{\text{total}}$

Γ_{10}/Γ

| <u>VALUE (%)</u> | <u>DOCUMENT ID</u> | <u>TECN</u> | <u>COMMENT</u> |
|------------------------------|----------------------|-------------|----------------|
| <10 % OUR ESTIMATE | | | |
| 7 ±3 | ADAMCZEW... 20 | DPWA | Multichannel |
| <0.7 | ¹ HUNT 19 | DPWA | Multichannel |
| <2 | SOKHOYAN 15A | DPWA | Multichannel |

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

| | | | | |
|-------|-----------------------|-----|------|--------------|
| <1 | ¹ SHRESTHA | 12A | DPWA | Multichannel |
| <4 | THOMA | 08 | DPWA | Multichannel |
| 1 ± 1 | VRANA | 00 | DPWA | Multichannel |

¹Statistical error only.

N(1520) PHOTON DECAY AMPLITUDES AT THE POLE

N(1520) → pγ, helicity-1/2 amplitude A_{1/2}

| <u>MODULUS (GeV^{-1/2})</u> | <u>PHASE (°)</u> | <u>DOCUMENT ID</u> | <u>TECN</u> | <u>COMMENT</u> |
|--|----------------------------------|--------------------|-------------|-------------------|
| -0.023 ± 0.004 | -6 ± 5 | SOKHOYAN | 15A | DPWA Multichannel |
| -0.024 ^{+0.008} _{-0.003} | -17 ⁺¹⁶ ₋₆ | ROENCHEN | 14 | DPWA |

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

| | | | | |
|--------|-----|----------|-----|-------------------|
| -0.031 | -17 | ROENCHEN | 15A | DPWA Multichannel |
|--------|-----|----------|-----|-------------------|

N(1520) → pγ, helicity-3/2 amplitude A_{3/2}

| <u>MODULUS (GeV^{-1/2})</u> | <u>PHASE (°)</u> | <u>DOCUMENT ID</u> | <u>TECN</u> | <u>COMMENT</u> |
|---|------------------|--------------------|-------------|-------------------|
| 0.131 ± 0.006 | 4 ± 4 | SOKHOYAN | 15A | DPWA Multichannel |
| 0.117 ^{+0.006} _{-0.010} | 26 ± 2 | ROENCHEN | 14 | DPWA |

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

| | | | | |
|-------|-----|----------|-----|-------------------|
| 0.075 | 1.7 | ROENCHEN | 15A | DPWA Multichannel |
|-------|-----|----------|-----|-------------------|

N(1520) BREIT-WIGNER PHOTON DECAY AMPLITUDES

N(1520) → pγ, helicity-1/2 amplitude A_{1/2}

| <u>VALUE (GeV^{-1/2})</u> | <u>DOCUMENT ID</u> | <u>TECN</u> | <u>COMMENT</u> |
|---|----------------------|-------------|-------------------|
| -0.030 to -0.015 (≈ -0.025) OUR ESTIMATE | | | |
| -0.034 ± 0.003 | ¹ HUNT | 19 | DPWA Multichannel |
| -0.024 ± 0.004 | SOKHOYAN | 15A | DPWA Multichannel |
| -0.015 ± 0.001 | ¹ SHKLYAR | 13 | DPWA Multichannel |
| -0.019 ± 0.002 | ¹ WORKMAN | 12A | DPWA γN → Nπ |
| -0.028 ± 0.002 | ¹ DUGGER | 07 | DPWA γN → πN |
| -0.038 ± 0.003 | ¹ AHRENS | 02 | DPWA γN → πN |

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

| | | | |
|------------------------|--------------------------|-----|-------------------|
| -0.022 ± 0.004 | ANISOVICH | 12A | DPWA Multichannel |
| -0.034 ± 0.001 | ¹ SHRESTHA | 12A | DPWA Multichannel |
| -0.027 | DRECHSEL | 07 | DPWA γN → πN |
| -0.003 | PENNER | 02D | DPWA Multichannel |
| -0.052 ± 0.010 ± 0.007 | ¹ MUKHOPAD... | 98 | γp → ηp |

¹Statistical error only.

N(1520) → pγ, helicity-3/2 amplitude A_{3/2}

| <u>VALUE (GeV^{-1/2})</u> | <u>DOCUMENT ID</u> | <u>TECN</u> | <u>COMMENT</u> |
|--|----------------------|-------------|-------------------|
| 0.135 to 0.145 (≈ 0.140) OUR ESTIMATE | | | |
| 0.142 ± 0.003 | ¹ HUNT | 19 | DPWA Multichannel |
| 0.130 ± 0.006 | SOKHOYAN | 15A | DPWA Multichannel |
| 0.146 ± 0.001 | ¹ SHKLYAR | 13 | DPWA Multichannel |

| | | | | |
|---|--------------------------|-----|------|-------------------------------|
| 0.141 ± 0.002 | ¹ WORKMAN | 12A | DPWA | $\gamma N \rightarrow N\pi$ |
| 0.143 ± 0.002 | ¹ DUGGER | 07 | DPWA | $\gamma N \rightarrow \pi N$ |
| 0.147 ± 0.010 | ¹ AHRENS | 02 | DPWA | $\gamma N \rightarrow \pi N$ |
| ● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ● | | | | |
| 0.131 ± 0.010 | ANISOVICH | 12A | DPWA | Multichannel |
| 0.127 ± 0.003 | ¹ SHRESTHA | 12A | DPWA | Multichannel |
| 0.161 | DRECHSEL | 07 | DPWA | $\gamma N \rightarrow \pi N$ |
| 0.151 | PENNER | 02D | DPWA | Multichannel |
| $0.130 \pm 0.020 \pm 0.015$ | ¹ MUKHOPAD... | 98 | | $\gamma p \rightarrow \eta p$ |

¹Statistical error only. **$N(1520) \rightarrow n\gamma$, helicity-1/2 amplitude $A_{1/2}$**

| <u>VALUE (GeV^{-1/2})</u> | <u>DOCUMENT ID</u> | <u>TECN</u> | <u>COMMENT</u> |
|---|-----------------------|-------------|-----------------------------------|
| −0.055 to −0.040 (≈ −0.050) OUR ESTIMATE | | | |
| $−0.072 \pm 0.003$ | ¹ HUNT | 19 | DPWA Multichannel |
| $−0.049 \pm 0.008$ | ANISOVICH | 13B | DPWA Multichannel |
| $−0.046 \pm 0.006$ | ¹ CHEN | 12A | DPWA $\gamma N \rightarrow \pi N$ |
| ● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ● | | | |
| $−0.038 \pm 0.003$ | ¹ SHRESTHA | 12A | DPWA Multichannel |
| $−0.077$ | DRECHSEL | 07 | DPWA $\gamma N \rightarrow \pi N$ |
| $−0.084$ | PENNER | 02D | DPWA Multichannel |

¹Statistical error only. **$N(1520) \rightarrow n\gamma$, helicity-3/2 amplitude $A_{3/2}$**

| <u>VALUE (GeV^{-1/2})</u> | <u>DOCUMENT ID</u> | <u>TECN</u> | <u>COMMENT</u> |
|---|-----------------------|-------------|-----------------------------------|
| −0.120 to −0.100 (≈ −0.115) OUR ESTIMATE | | | |
| $−0.123 \pm 0.006$ | ¹ HUNT | 19 | DPWA Multichannel |
| $−0.113 \pm 0.012$ | ANISOVICH | 13B | DPWA Multichannel |
| $−0.115 \pm 0.005$ | ¹ CHEN | 12A | DPWA $\gamma N \rightarrow \pi N$ |
| ● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ● | | | |
| $−0.101 \pm 0.004$ | ¹ SHRESTHA | 12A | DPWA Multichannel |
| $−0.154$ | DRECHSEL | 07 | DPWA $\gamma N \rightarrow \pi N$ |
| $−0.159$ | PENNER | 02D | DPWA Multichannel |

¹Statistical error only. **$N(1520)$ REFERENCES**

For early references, see Physics Letters **111B** 1 (1982). For very early references, see Reviews of Modern Physics **37** 633 (1965).

| | | | |
|----------------|---------------------|------------------------------------|--------------------------|
| ADAMCZEW... 20 | PR C102 024001 | J. Adamczewski-Musch <i>et al.</i> | (HADES Collab.) |
| MUELLER 20 | PL B803 135323 | J. Mueller <i>et al.</i> | (CBELSA/TAPS Collab.) |
| HUNT 19 | PR C99 055205 | B.C. Hunt, D.M. Manley | |
| ROENCHEN 15A | EPJ A51 70 | D. Roenchen <i>et al.</i> | |
| SOKHOYAN 15A | EPJ A51 95 | V. Sokhoyan <i>et al.</i> | (CBELSA/TAPS Collab.) |
| PDG 14 | CP C38 070001 | K. Olive <i>et al.</i> | (PDG Collab.) |
| ROENCHEN 14 | EPJ A50 101 | D. Roenchen <i>et al.</i> | |
| Also | EPJ A51 63 (errat.) | D. Roenchen <i>et al.</i> | |
| SVARC 14 | PR C89 045205 | A. Svarc <i>et al.</i> | (RBI Zagreb, UNI Tuzla) |
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| MUKHOPAD... | 98 | PL B444 7 | N.C. Mukhopadhyay, N. Mathur | |
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