

$N(1720) \ 3/2^+$ $I(J^P) = \frac{1}{2}(3/2^+)$ Status: ****

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

 $N(1720)$ POLE POSITION**REAL PART**

<u>VALUE (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
1660 to 1690 (\approx 1675) OUR ESTIMATE			
1670 \pm 25	SOKHOYAN	15A	DPWA Multichannel
1677 \pm 4 \pm 1	¹ SVARC	14	L+P $\pi N \rightarrow \pi N$
1680 \pm 30	CUTKOSKY	80	IPWA $\pi N \rightarrow \pi N$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
1654	HUNT	19	DPWA Multichannel
1710	ROENCHEN	15A	DPWA Multichannel
1670	SHKLYAR	13	DPWA Multichannel
1660 \pm 30	ANISOVICH	12A	DPWA Multichannel
1691 \pm 23	BATINIC	10	DPWA $\pi N \rightarrow N\pi, N\eta$
1666	ARNDT	06	DPWA $\pi N \rightarrow \pi N, \eta N$
1692	VRANA	00	DPWA Multichannel
1686	HOEHLER	93	SPED $\pi N \rightarrow \pi N$

¹ Fit to the amplitudes of HOEHLER 79.**– 2×IMAGINARY PART**

<u>VALUE (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
150 to 400 (\approx 250) OUR ESTIMATE			
430 \pm 100	SOKHOYAN	15A	DPWA Multichannel
184 \pm 8 \pm 1	¹ SVARC	14	L+P $\pi N \rightarrow \pi N$
120 \pm 40	CUTKOSKY	80	IPWA $\pi N \rightarrow \pi N$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
100	HUNT	19	DPWA Multichannel
219	ROENCHEN	15A	DPWA Multichannel
118	SHKLYAR	13	DPWA Multichannel
450 \pm 100	ANISOVICH	12A	DPWA Multichannel
233 \pm 23	BATINIC	10	DPWA $\pi N \rightarrow N\pi, N\eta$
355	ARNDT	06	DPWA $\pi N \rightarrow \pi N, \eta N$
94	VRANA	00	DPWA Multichannel
187	HOEHLER	93	SPED $\pi N \rightarrow \pi N$

¹ Fit to the amplitudes of HOEHLER 79. **$N(1720)$ ELASTIC POLE RESIDUE****MODULUS $|r|$**

<u>VALUE (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
10 to 25 (\approx 15) OUR ESTIMATE			
26 \pm 10	SOKHOYAN	15A	DPWA Multichannel
13 \pm 1	¹ SVARC	14	L+P $\pi N \rightarrow \pi N$
8 \pm 2	CUTKOSKY	80	IPWA $\pi N \rightarrow \pi N$

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

4.2	ROENCHEN	15A	DPWA	Multichannel
12	SHKLYAR	13	DPWA	Multichannel
22 ± 8	ANISOVICH	12A	DPWA	Multichannel
20	BATINIC	10	DPWA	$\pi N \rightarrow N\pi, N\eta$
25	ARNDT	06	DPWA	$\pi N \rightarrow \pi N, \eta N$
15	HOEHLER	93	SPED	$\pi N \rightarrow \pi N$

¹ Fit to the amplitudes of HOEHLER 79.

PHASE θ

<u>VALUE (°)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
–160 to –100 (≈ –130) OUR ESTIMATE			
–100 ± 25	SOKHOYAN	15A	DPWA Multichannel
–115 ± 3 ± 2	¹ SVARC	14	L+P $\pi N \rightarrow \pi N$
–160 ± 30	CUTKOSKY	80	IPWA $\pi N \rightarrow \pi N$

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

– 47	ROENCHEN	15A	DPWA	Multichannel
– 45	SHKLYAR	13	DPWA	Multichannel
–115 ± 30	ANISOVICH	12A	DPWA	Multichannel
–109	BATINIC	10	DPWA	$\pi N \rightarrow N\pi, N\eta$
– 94	ARNDT	06	DPWA	$\pi N \rightarrow \pi N, \eta N$

¹ Fit to the amplitudes of HOEHLER 79.

N(1720) INELASTIC POLE RESIDUE

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

Normalized residue in $N\pi \rightarrow N(1720) \rightarrow N\eta$

<u>MODULUS</u>	<u>PHASE (°)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
0.03 ± 0.02		ANISOVICH	12A	DPWA Multichannel
• • •				• • •
0.007	106	ROENCHEN	15A	DPWA Multichannel

Normalized residue in $N\pi \rightarrow N(1720) \rightarrow \Lambda K$

<u>MODULUS</u>	<u>PHASE (°)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
0.06 ± 0.04	–150 ± 45	ANISOVICH	12A	DPWA Multichannel
• • •				• • •
0.011	–70	ROENCHEN	15A	DPWA Multichannel

Normalized residue in $N\pi \rightarrow N(1720) \rightarrow \Sigma K$

<u>MODULUS</u>	<u>PHASE (°)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
• • •				• • •
0.002	79	ROENCHEN	15A	DPWA Multichannel

Normalized residue in $N\pi \rightarrow N(1720) \rightarrow \Delta\pi, P\text{-wave}$

<u>MODULUS</u>	<u>PHASE (°)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
0.28 ± 0.09	95 ± 30	SOKHOYAN	15A	DPWA Multichannel
• • •				• • •
0.29 ± 0.08	80 ± 40	ANISOVICH	12A	DPWA Multichannel

Normalized residue in $N\pi \rightarrow N(1720) \rightarrow \Delta\pi$, F-wave

<u>MODULUS</u>	<u>PHASE ($^\circ$)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
0.07±0.05		SOKHOYAN	15A DPWA	Multichannel
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●				
0.03±0.03		ANISOVICH	12A DPWA	Multichannel

Normalized residue in $N\pi \rightarrow N(1720) \rightarrow N\sigma$

<u>MODULUS</u>	<u>PHASE ($^\circ$)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
0.08±0.04	-110 ± 35	SOKHOYAN	15A DPWA	Multichannel

Normalized residue in $N\pi \rightarrow N(1720) \rightarrow N(1520)\pi$, S-wave

<u>MODULUS</u>	<u>PHASE ($^\circ$)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
0.05±0.04	undefined	SOKHOYAN	15A DPWA	Multichannel

 $N(1720)$ BREIT-WIGNER MASS

<u>VALUE (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
1680 to 1750 (≈ 1720) OUR ESTIMATE			
1745 ± 6	GOLOVATCH	19 DPWA	$\gamma p \rightarrow \pi^+ \pi^- p$
1711 ± 4	¹ HUNT	19 DPWA	Multichannel
1690 ± 30	SOKHOYAN	15A DPWA	Multichannel
1700 ± 10	¹ SHKLYAR	13 DPWA	Multichannel
1763.8± 4.6	ARNDT	06 DPWA	$\pi N \rightarrow \pi N, \eta N$
1700 ± 50	CUTKOSKY	80 IPWA	$\pi N \rightarrow \pi N$
1710 ± 20	HOEHLER	79 IPWA	$\pi N \rightarrow \pi N$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
1748 ± 5	² MOKEEV	20 DPWA	$\gamma p \rightarrow \pi^+ \pi^- p$
1725 ± 10	³ MOKEEV	20 DPWA	$\gamma p \rightarrow \pi^+ \pi^- p$
1690 + 70 - 35	ANISOVICH	12A DPWA	Multichannel
1720 ± 5	¹ SHRESTHA	12A DPWA	Multichannel
1720 ± 18	BATINIC	10 DPWA	$\pi N \rightarrow N\pi, N\eta$
1705 ± 10	PENNER	02C DPWA	Multichannel
1716 ± 112	VRANA	00 DPWA	Multichannel
¹ Statistical error only.			
² State a) of two states seen by the CLAS collaboration.			
³ State b) of two states seen by the CLAS collaboration.			

 $N(1720)$ BREIT-WIGNER WIDTH

<u>VALUE (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
150 to 400 (≈ 250) OUR ESTIMATE			
116± 27	GOLOVATCH	19 DPWA	$\gamma p \rightarrow \pi^+ \pi^- p$
229± 22	¹ HUNT	19 DPWA	Multichannel
420± 80	SOKHOYAN	15A DPWA	Multichannel
152± 2	¹ SHKLYAR	13 DPWA	Multichannel
210± 22	ARNDT	06 DPWA	$\pi N \rightarrow \pi N, \eta N$
125± 70	CUTKOSKY	80 IPWA	$\pi N \rightarrow \pi N$
190± 30	HOEHLER	79 IPWA	$\pi N \rightarrow \pi N$

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

114 ± 6	² MOKEEV	20	DPWA	$\gamma p \rightarrow \pi^+ \pi^- p$
120 ± 6	³ MOKEEV	20	DPWA	$\gamma p \rightarrow \pi^+ \pi^- p$
420 ± 100	ANISOVICH	12A	DPWA	Multichannel
200 ± 20	¹ SHRESTHA	12A	DPWA	Multichannel
244 ± 28	BATINIC	10	DPWA	$\pi N \rightarrow N\pi, N\eta$
237 ± 73	PENNER	02C	DPWA	Multichannel
121 ± 39	VRANA	00	DPWA	Multichannel

¹ Statistical error only.

² State a) of two states seen by the CLAS collaboration.

³ State b) of two states seen by the CLAS collaboration.

N(1720) DECAY MODES

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

Mode	Fraction (Γ_j/Γ)
Γ_1 $N\pi$	8–14 %
Γ_2 $N\eta$	1–5 %
Γ_3 $N\omega$	12–40 %
Γ_4 ΛK	4–5 %
Γ_5 $N\pi\pi$	50–90 %
Γ_6 $\Delta(1232)\pi$	47–89 %
Γ_7 $\Delta(1232)\pi, P\text{-wave}$	47–77 %
Γ_8 $\Delta(1232)\pi, F\text{-wave}$	<12 %
Γ_9 $N\rho$	
Γ_{10} $N\rho, S=1/2, P\text{-wave}$	1–2 %
Γ_{11} $N\sigma$	2–14 %
Γ_{12} $N(1440)\pi$	<2 %
Γ_{13} $N(1520)\pi, S\text{-wave}$	1–5 %
Γ_{14} $p\gamma$	0.05–0.25 %
Γ_{15} $p\gamma, \text{helicity}=1/2$	0.05–0.15 %
Γ_{16} $p\gamma, \text{helicity}=3/2$	0.002–0.16 %
Γ_{17} $n\gamma$	0.0–0.016 %
Γ_{18} $n\gamma, \text{helicity}=1/2$	0.0–0.01 %
Γ_{19} $n\gamma, \text{helicity}=3/2$	0.0–0.015 %

N(1720) BRANCHING RATIOS

$\Gamma(N\pi)/\Gamma_{\text{total}}$					Γ_1/Γ
VALUE (%)	DOCUMENT ID	TECN	COMMENT		
8 to 14 (≈ 11) OUR ESTIMATE					
18 ± 2	¹ HUNT	19	DPWA	Multichannel	
11 ± 4	SOKHOYAN	15A	DPWA	Multichannel	
17 ± 2	¹ SHKLYAR	13	DPWA	Multichannel	
9.4 ± 0.5	ARNDT	06	DPWA	$\pi N \rightarrow \pi N, \eta N$	

10 ±4	CUTKOSKY	80	IPWA	$\pi N \rightarrow \pi N$
14 ±3	HOEHLER	79	IPWA	$\pi N \rightarrow \pi N$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●				
10 ±5	ANISOVICH	12A	DPWA	Multichannel
13.6±0.6	¹ SHRESTHA	12A	DPWA	Multichannel
18 ±3	BATINIC	10	DPWA	$\pi N \rightarrow N\pi, N\eta$
17 ±2	PENNER	02C	DPWA	Multichannel
5 ±5	VRANA	00	DPWA	Multichannel

¹Statistical error only.

$\Gamma(N\eta)/\Gamma_{\text{total}}$ **Γ_2/Γ**

<u>VALUE (%)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
1 to 5 (≈ 3) OUR ESTIMATE			
3 ±2	MUELLER	20	DPWA Multichannel
3.8±0.5	¹ HUNT	19	DPWA Multichannel
< 1	SHKLYAR	13	DPWA Multichannel
3 ±2	ANISOVICH	12A	DPWA Multichannel
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
< 1	¹ SHRESTHA	12A	DPWA Multichannel
0 ±1	BATINIC	10	DPWA $\pi N \rightarrow N\pi, N\eta$
10 ±7	THOMA	08	DPWA Multichannel
0.2±0.2	PENNER	02C	DPWA Multichannel
4 ±1	VRANA	00	DPWA Multichannel

¹Statistical error only.

$\Gamma(N\omega)/\Gamma_{\text{total}}$ **Γ_3/Γ**

<u>VALUE (%)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
26±14	DENISENKO	16	DPWA Multichannel

$\Gamma(\Lambda K)/\Gamma_{\text{total}}$ **Γ_4/Γ**

<u>VALUE (%)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
16 ±3	¹ HUNT	19	DPWA Multichannel
4.3±0.4	SHKLYAR	05	DPWA Multichannel
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
2.8±0.4	¹ SHRESTHA	12A	DPWA Multichannel
12 ±9	THOMA	08	DPWA Multichannel
9 ±3	PENNER	02C	DPWA Multichannel

¹Statistical error only.

$\Gamma(N\pi\pi)/\Gamma_{\text{total}}$ **Γ_5/Γ**

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
0.84±0.16	GOLOVATCH	19	DPWA $\gamma p \rightarrow \pi^+ \pi^- p$

$\Gamma(\Delta(1232)\pi)/\Gamma_{\text{total}}$ **Γ_6/Γ**

<u>VALUE (%)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
45±8	¹ MOKEEV	20	DPWA $\gamma p \rightarrow \pi^+ \pi^- p$
54±8	² MOKEEV	20	DPWA $\gamma p \rightarrow \pi^+ \pi^- p$

¹ State a) of two states seen by the CLAS collaboration.

² State b) of two states seen by the CLAS collaboration.

$\Gamma(\Delta(1232)\pi, P\text{-wave})/\Gamma_{\text{total}}$ Γ_7/Γ

<u>VALUE (%)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
62 ± 15	SOKHOYAN 15A	DPWA	Multichannel
• • • We do not use the following data for averages, fits, limits, etc. • • •			
75 ± 15	ANISOVICH 12A	DPWA	Multichannel

$\Gamma(\Delta(1232)\pi, F\text{-wave})/\Gamma_{\text{total}}$ Γ_8/Γ

<u>VALUE (%)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
6 ± 6	SOKHOYAN 15A	DPWA	Multichannel

$\Gamma(N\rho)/\Gamma_{\text{total}}$ Γ_9/Γ

<u>VALUE (%)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
• • • We do not use the following data for averages, fits, limits, etc. • • •			
38 ± 8	¹ MOKEEV 20	DPWA	$\gamma p \rightarrow \pi^+ \pi^- p$
7 ± 3	² MOKEEV 20	DPWA	$\gamma p \rightarrow \pi^+ \pi^- p$

¹ State a) of two states seen by the CLAS collaboration.

² State b) of two states seen by the CLAS collaboration.

$\Gamma(N\rho, S=1/2, P\text{-wave})/\Gamma_{\text{total}}$ Γ_{10}/Γ

<u>VALUE (%)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
1.4 ± 0.5	¹ SHRESTHA 12A	DPWA	Multichannel
• • • We do not use the following data for averages, fits, limits, etc. • • •			
91 ± 1	VRANA 00	DPWA	Multichannel

¹ Statistical error only.

$\Gamma(N\sigma)/\Gamma_{\text{total}}$ Γ_{11}/Γ

<u>VALUE (%)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
8 ± 6	SOKHOYAN 15A	DPWA	Multichannel

$\Gamma(N(1440)\pi)/\Gamma_{\text{total}}$ Γ_{12}/Γ

<u>VALUE (%)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
< 2	SOKHOYAN 15A	DPWA	Multichannel

$\Gamma(N(1520)\pi, S\text{-wave})/\Gamma_{\text{total}}$ Γ_{13}/Γ

<u>VALUE (%)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
3 ± 2	SOKHOYAN 15A	DPWA	Multichannel

$N(1720)$ PHOTON DECAY AMPLITUDES AT THE POLE

$N(1720) \rightarrow p\gamma$, helicity-1/2 amplitude $A_{1/2}$

<u>MODULUS ($\text{GeV}^{-1/2}$)</u>	<u>PHASE ($^\circ$)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
0.115 ± 0.045	0 ± 35	SOKHOYAN 15A	DPWA	Multichannel
0.051 ^{+0.005} _{-0.004}	57 ⁺⁹ ₋₄	ROENCHEN 14	DPWA	
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.039	5.3	ROENCHEN 15A	DPWA	Multichannel

$N(1720) \rightarrow p\gamma$, helicity-3/2 amplitude $A_{3/2}$

<u>MODULUS ($\text{GeV}^{-1/2}$)</u>	<u>PHASE ($^\circ$)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
0.140 ± 0.040	65 ± 35	SOKHOYAN	15A	DPWA Multichannel
$0.014^{+0.009}_{-0.003}$	102^{+29}_{-59}	ROENCHEN	14	DPWA
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●				
0.032	66	ROENCHEN	15A	DPWA Multichannel

 $N(1720)$ BREIT-WIGNER PHOTON DECAY AMPLITUDES **$N(1720) \rightarrow p\gamma$, helicity-1/2 amplitude $A_{1/2}$**

<u>VALUE ($\text{GeV}^{-1/2}$)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
0.080 to 0.120 (≈ 0.100) OUR ESTIMATE			
0.0809 ± 0.0115	GOLOVATCH 19	DPWA	$\gamma p \rightarrow \pi^+ \pi^- p$
0.068 ± 0.004	¹ HUNT 19	DPWA	Multichannel
0.115 ± 0.045	SOKHOYAN 15A	DPWA	Multichannel
-0.065 ± 0.002	¹ SHKLYAR 13	DPWA	Multichannel
0.095 ± 0.002	WORKMAN 12A	DPWA	$\gamma N \rightarrow N\pi$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
0.110 ± 0.045	ANISOVICH 12A	DPWA	Multichannel
0.057 ± 0.003	¹ SHRESTHA 12A	DPWA	Multichannel
0.073	DRECHSEL 07	DPWA	$\gamma N \rightarrow \pi N$
0.097 ± 0.003	DUGGER 07	DPWA	$\gamma N \rightarrow \pi N$
-0.053	PENNER 02D	DPWA	Multichannel

¹Statistical error only. **$N(1720) \rightarrow p\gamma$, helicity-3/2 amplitude $A_{3/2}$**

<u>VALUE ($\text{GeV}^{-1/2}$)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
-0.034 ± 0.0076	GOLOVATCH 19	DPWA	$\gamma p \rightarrow \pi^+ \pi^- p$
0.028 ± 0.003	¹ HUNT 19	DPWA	Multichannel
0.135 ± 0.040	SOKHOYAN 15A	DPWA	Multichannel
0.035 ± 0.002	¹ SHKLYAR 13	DPWA	Multichannel
-0.048 ± 0.002	WORKMAN 12A	DPWA	$\gamma N \rightarrow N\pi$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
0.150 ± 0.030	ANISOVICH 12A	DPWA	Multichannel
-0.019 ± 0.002	¹ SHRESTHA 12A	DPWA	Multichannel
-0.011	DRECHSEL 07	DPWA	$\gamma N \rightarrow \pi N$
-0.039 ± 0.003	DUGGER 07	DPWA	$\gamma N \rightarrow \pi N$
0.027	PENNER 02D	DPWA	Multichannel

¹Statistical error only. **$N(1720) \rightarrow n\gamma$, helicity-1/2 amplitude $A_{1/2}$**

<u>VALUE ($\text{GeV}^{-1/2}$)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
-0.064 ± 0.006	¹ HUNT 19	DPWA	Multichannel
-0.080 ± 0.050	ANISOVICH 13B	DPWA	Multichannel
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
-0.002 ± 0.001	¹ SHRESTHA 12A	DPWA	Multichannel

−0.003	DRECHSEL	07	DPWA	$\gamma N \rightarrow \pi N$
−0.004	PENNER	02D	DPWA	Multichannel

¹Statistical error only. **$N(1720) \rightarrow n\gamma$, helicity-3/2 amplitude $A_{3/2}$**

VALUE (GeV ^{−1/2})	DOCUMENT ID	TECN	COMMENT
−0.004±0.006	¹ HUNT	19	DPWA Multichannel
−0.140±0.065	ANISOVICH	13B	DPWA Multichannel
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
−0.001±0.002	¹ SHRESTHA	12A	DPWA Multichannel
−0.031	DRECHSEL	07	DPWA $\gamma N \rightarrow \pi N$
0.003	PENNER	02D	DPWA Multichannel

¹Statistical error only. **$N(1720)$ REFERENCES**For early references, see Physics Letters **111B** 1 (1982).

MOKEEV	20	PL B805 135457	V.I. Mokeev <i>et al.</i>	(CLAS Collab.)
MUELLER	20	PL B803 135323	J. Mueller <i>et al.</i>	(CBELSA/TAPS Collab.)
GOLOVATCH	19	PL B788 371	E. Golovatch <i>et al.</i>	(CLAS Collab.)
HUNT	19	PR C99 055205	B.C. Hunt, D.M. Manley	
DENISENKO	16	PL B755 97	I. Denisenko <i>et al.</i>	
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)
ANISOVICH	13B	EPJ A49 67	A.V. Anisovich <i>et al.</i>	
SHKLYAR	13	PR C87 015201	V. Shklyar, H. Lenske, U. Mosel	(GIES)
ANISOVICH	12A	EPJ A48 15	A.V. Anisovich <i>et al.</i>	(BONN, PNPI)
SHRESTHA	12A	PR C86 055203	M. Shrestha, D.M. Manley	(KSU)
WORKMAN	12A	PR C86 015202	R. Workman <i>et al.</i>	(GWU)
BATINIC	10	PR C82 038203	M. Batinic <i>et al.</i>	(ZAGR)
THOMA	08	PL B659 87	U. Thoma <i>et al.</i>	(CB-ELSA Collab.)
DRECHSEL	07	EPJ A34 69	D. Drechsel, S.S. Kamalov, L. Tiator	(MAINZ, JINR)
DUGGER	07	PR C76 025211	M. Dugger <i>et al.</i>	(JLab CLAS Collab.)
ARNDT	06	PR C74 045205	R.A. Arndt <i>et al.</i>	(GWU)
SHKLYAR	05	PR C72 015210	V. Shklyar, H. Lenske, U. Mosel	(GIES)
PENNER	02C	PR C66 055211	G. Penner, U. Mosel	(GIES)
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VRANA	00	PRPL 328 181	T.P. Vrana, S.A. Dytman, T.-S.H. Lee	(PITT, ANL)
HOEHLER	93	πN Newsletter 9 1	G. Hohler	(KARL)
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