NODE=B063

$N(1535)\ 1/2^-$

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

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

NODE=B063

N(1535) POLE POSITION

NODE=B063215

REAL PART

NODE=B063RE
NODE=B063RE

VALUE (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
1500 to 1520 (≈ 1510) OUR ESTIMATE				→ UNCHECKED ←
1494± 7	SARANTSEV	25	DPWA	Multichannel
1504± 0	ROENCHEN	22	DPWA	Multichannel
1496± 4	AFZAL	20	DPWA	Multichannel
1509± 4±2	[1] SVARC	14	L+P	$\pi N \to \pi N$
1510±50	CUTKOSKY	80	IPWA	$\pi N \to \pi N$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
1496	HUNT	19	DPWA	Multichannel
1499	ROENCHEN	15A	DPWA	Multichannel
1500± 4	SOKHOYAN	15A	DPWA	Multichannel
1490	SHKLYAR	13	DPWA	Multichannel
1521±14	BATINIC	10	DPWA	$\pi N \to N\pi,\ N\eta$
1502	ARNDT	06	DPWA	$\pi N \to \pi N,\ \eta N$
1525	VRANA	00	DPWA	Multichannel
1487	HOEHLER	93	SPED	$\pi N \to \pi N$

[1] Fit to the amplitudes of HOEHLER 79.

NODE=B063RE;LINKAGE=SV

−2×IMAGINARY PART

NODE=B063IM
NODE=B063IM

VALUE (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
80 to 130 (≈ 110) OUR ESTIMATE				→ UNCHECKED ←
115±10	SARANTSEV	25	DPWA	Multichannel
74± 1	ROENCHEN	22	DPWA	Multichannel
125± 6	AFZAL	20	DPWA	Multichannel
118± 9±2	[2] SVARC	14	L+P	$\pi N \to \pi N$
260±80	CUTKOSKY	80	IPWA	$\pi N \to \pi N$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
119	HUNT	19	DPWA	Multichannel
104	ROENCHEN	15A	DPWA	Multichannel
128± 9	SOKHOYAN	15A	DPWA	Multichannel
100	SHKLYAR	13	DPWA	Multichannel
190±28	BATINIC	10	DPWA	$\pi N \to N\pi,\ N\eta$
95	ARNDT	06	DPWA	$\pi N \to \pi N,\ \eta N$
102	VRANA	00	DPWA	Multichannel

[2] Fit to the amplitudes of HOEHLER 79.

NODE=B063IM;LINKAGE=SV

N(1535) ELASTIC POLE RESIDUE

NODE=B063220

MODULUS $|r|$

NODE=B063RER
NODE=B063RER

VALUE (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
15 to 35 (≈ 25) OUR ESTIMATE				→ UNCHECKED ←
18± 1	ROENCHEN	22	DPWA	Multichannel
29± 4	SOKHOYAN	15A	DPWA	Multichannel
22± 2±0.4	[3] SVARC	14	L+P	$\pi N \to \pi N$
120±40	CUTKOSKY	80	IPWA	$\pi N \to \pi N$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
22	ROENCHEN	15A	DPWA	Multichannel
15	SHKLYAR	13	DPWA	Multichannel
31± 4	ANISOVICH	12A	DPWA	Multichannel
68	BATINIC	10	DPWA	$\pi N \to N\pi,\ N\eta$
16	ARNDT	06	DPWA	$\pi N \to \pi N,\ \eta N$

[3] Fit to the amplitudes of HOEHLER 79.

NODE=B063RER;LINKAGE=SV

PHASE θ

NODE=B063IMR
NODE=B063IMR

VALUE (°)	DOCUMENT ID		TECN	COMMENT
−40 to 0 (≈ − 20) OUR ESTIMATE				→ UNCHECKED ←
−37± 2	ROENCHEN	22	DPWA	Multichannel
−20±10	SOKHOYAN	15A	DPWA	Multichannel
− 5± 5±3	[4] SVARC	14	L+P	$\pi N \to \pi N$
+15±45	CUTKOSKY	80	IPWA	$\pi N \to \pi N$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
−46	ROENCHEN	15A	DPWA	Multichannel
−51	SHKLYAR	13	DPWA	Multichannel
−29± 5	ANISOVICH	12A	DPWA	Multichannel
12	BATINIC	10	DPWA	$\pi N \to N\pi$, $N\eta$
−16	ARNDT	06	DPWA	$\pi N \to \pi N$, ηN

[4] Fit to the amplitudes of HOEHLER 79.

NODE=B063IMR;LINKAGE=SV

$N(1535)$ INELASTIC POLE RESIDUE

NODE=B063240

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

NODE=B063240

Normalized residue in $N\pi \to N(1535) \to N\eta$

NODE=B063RS1
NODE=B063RS1

MODULUS	PHASE (°)	DOCUMENT ID		TECN	COMMENT
0.50±0.02	118 ± 1	ROENCHEN	22	DPWA	Multichannel
0.43±0.03	−76 ± 5	ANISOVICH	12A	DPWA	Multichannel
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.51	112	ROENCHEN	15A	DPWA	Multichannel

Normalized residue in $N\pi \to N(1535) \to \Lambda K$

NODE=B063A01
NODE=B063A01

MODULUS	PHASE (°)	DOCUMENT ID		TECN	COMMENT
0.26±0.01	−67 ± 2	ROENCHEN	22	DPWA	Multichannel
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.05	32	ROENCHEN	15A	DPWA	Multichannel

Normalized residue in $N\pi \to N(1535) \to \Sigma K$

NODE=B063A02
NODE=B063A02

MODULUS	PHASE (°)	DOCUMENT ID		TECN	COMMENT
0.28±0.01	92 ± 2	ROENCHEN	22	DPWA	Multichannel
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.05	−69	ROENCHEN	15A	DPWA	Multichannel

Normalized residue in $N\pi \to N(1535) \to \Delta\pi$, D-wave

NODE=B063RS2
NODE=B063RS2

MODULUS	PHASE (°)	DOCUMENT ID		TECN	COMMENT
0.11±0.02	160 ± 20	SOKHOYAN	15A	DPWA	Multichannel
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.12±0.03	145 ± 17	ANISOVICH	12A	DPWA	Multichannel

Normalized residue in $N\pi \to N(1535) \to N\sigma$

NODE=B063RS3
NODE=B063RS3

MODULUS	PHASE (°)	DOCUMENT ID		TECN	COMMENT
0.16±0.07	25 ± 40	SOKHOYAN	15A	DPWA	Multichannel

Normalized residue in $N\pi \to N(1535) \to N(1440)\pi$

NODE=B063RS4
NODE=B063RS4

MODULUS	PHASE (°)	DOCUMENT ID		TECN	COMMENT
0.21±0.14	−45 ± 50	SOKHOYAN	15A	DPWA	Multichannel

$N(1535)$ BREIT-WIGNER MASS

NODE=B063M

NODE=B063M

VALUE (MeV)	DOCUMENT ID		TECN	COMMENT
1515 to 1545 (≈ 1530) OUR ESTIMATE				→ UNCHECKED ←
1517 ± 4	SARANTSEV	25	DPWA	Multichannel
1525 ± 2	[5] HUNT	19	DPWA	Multichannel
1528 ± 6	KASHEVAROV	17	DPWA	$\gamma p \to \eta p$, $\eta' p$
1517 ± 4	SOKHOYAN	15A	DPWA	Multichannel
1526 ± 2	[5] SHKLYAR	13	DPWA	Multichannel
1547.0± 0.7	[5] ARNDT	06	DPWA	$\pi N \to \pi N$, ηN
1550 ±40	CUTKOSKY	80	IPWA	$\pi N \to \pi N$
1526 ± 7	HOEHLER	79	IPWA	$\pi N \to \pi N$

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

1519 ± 5	ANISOVICH	12A	DPWA	Multichannel
1538 ± 1	[5] SHRESTHA	12A	DPWA	Multichannel
1553 ± 8	BATINIC	10	DPWA	$\pi N \to N\pi$, $N\eta$
1546.7 ± 2.2	ARNDT	04	DPWA	$\pi N \to \pi N$, ηN
1526 ± 2	PENNER	02C	DPWA	Multichannel
1530 ±10	BAI	01B	BES	$J/\psi \to p\bar{p}\eta$
1522 ±11	THOMPSON	01	CLAS	$\gamma^* p \to p\eta$
1542 ± 3	VRANA	00	DPWA	Multichannel
1532 ± 5	ARMSTRONG	99B	DPWA	$\gamma^* p \to p\eta$

[5] Statistical error only.

NODE=B063M;LINKAGE=B

$N(1535)$ BREIT-WIGNER WIDTH

NODE=B063W

NODE=B063W

VALUE (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
125 to 175 (≈ 150) OUR ESTIMATE				→ UNCHECKED ←
115 ± 7	SARANTSEV	25	DPWA	Multichannel
147 ± 5	[6] HUNT	19	DPWA	Multichannel
163 ±25	KASHEVAROV	17	DPWA	$\gamma p \to \eta p$, $\eta' p$
120 ±10	SOKHOYAN	15A	DPWA	Multichannel
131 ±12	[6] SHKLYAR	13	DPWA	Multichannel
188.4 ± 3.8	[6] ARNDT	06	DPWA	$\pi N \to \pi N$, ηN
240 ±80	CUTKOSKY	80	IPWA	$\pi N \to \pi N$
120 ±20	HOEHLER	79	IPWA	$\pi N \to \pi N$

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

128 ±14	ANISOVICH	12A	DPWA	Multichannel
141 ± 4	[6] SHRESTHA	12A	DPWA	Multichannel
182 ±25	BATINIC	10	DPWA	$\pi N \to N\pi$, $N\eta$
129 ± 8	PENNER	02C	DPWA	Multichannel
95 ±25	BAI	01B	BES	$J/\psi \to p\bar{p}\eta$
143 ±18	THOMPSON	01	CLAS	$\gamma^* p \to p\eta$
112 ±19	VRANA	00	DPWA	Multichannel
154 ±20	ARMSTRONG	99B	DPWA	$\gamma^* p \to p\eta$

[6] Statistical error only.

NODE=B063W;LINKAGE=A

$N(1535)$ DECAY MODES

NODE=B063225;NODE=B063

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

NODE=B063

	Mode	Fraction (Γ_i/Γ)	
Γ_1	$N\pi$	32–52 %	DESIG=1
Γ_2	$N\eta$	30–55 %	DESIG=2
Γ_3	$N\pi\pi$	4–31 %	DESIG=4;OUR EST
Γ_4	$\Delta(1232)\pi$	1–4 %	DESIG=5
Γ_5	$N\rho$	2–17 %	DESIG=188;OUR EST
Γ_6	$N\rho$, S=1/2	2–16 %	DESIG=189
Γ_7	$N\rho$, S=3/2	<1 %	DESIG=190
Γ_8	$N\sigma$	2–10 %	DESIG=8
Γ_9	$N(1440)\pi$	5–12 %	DESIG=11
Γ_{10}	$p\gamma$, helicity=1/2	0.15–0.30 %	DESIG=9;OUR EST
Γ_{11}	$n\gamma$, helicity=1/2	0.01–0.25 %	DESIG=10;OUR EST

$N(1535)$ BRANCHING RATIOS

NODE=B063230

$\Gamma(N\pi)/\Gamma_{\text{total}}$ Γ_1/Γ

NODE=B063R1

NODE=B063R1

VALUE (%)	*DOCUMENT ID*		*TECN*	*COMMENT*
32–52 % OUR ESTIMATE				→ UNCHECKED ←
46 ± 5	SEIFEN	25	DPWA	Multichannel
42 ± 2	[7] HUNT	19	DPWA	Multichannel
35 ± 3	[7] SHKLYAR	13	DPWA	Multichannel
35.5 ± 0.2	[7] ARNDT	06	DPWA	$\pi N \to \pi N$, ηN
50 ±10	CUTKOSKY	80	IPWA	$\pi N \to \pi N$
38 ± 4	HOEHLER	79	IPWA	$\pi N \to \pi N$

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

52 ± 5	SOKHOYAN	15A	DPWA	Multichannel
37 ± 1	[7] SHRESTHA	12A	DPWA	Multichannel
46 ± 7	BATINIC	10	DPWA	$\pi N \to N\pi$, $N\eta$
36 ± 1	PENNER	02C	DPWA	Multichannel
35 ± 8	VRANA	00	DPWA	Multichannel

[7] Statistical error only.

NODE=B063R1;LINKAGE=A

$\Gamma(N\eta)/\Gamma_{total}$ Γ_2/Γ

NODE=B063R7

VALUE (%)	DOCUMENT ID		TECN	COMMENT
30–55 % OUR ESTIMATE				
41±4	MUELLER	20	DPWA	Multichannel
43±3	[8] HUNT	19	DPWA	Multichannel
41±4	[9] KASHEVAROV	17	DPWA	$\gamma p \to \eta p$, $\eta' p$
58±4	[8] SHKLYAR	13	DPWA	Multichannel
33±5	ANISOVICH	12A	DPWA	Multichannel
53±1	PENNER	02C	DPWA	Multichannel
51±5	VRANA	00	DPWA	Multichannel
• • • We do not use the following data for averages, fits, limits, etc. • • •				
41±2	[8] SHRESTHA	12A	DPWA	Multichannel
50±7	BATINIC	10	DPWA	$\pi N \to N\pi$, $N\eta$

NODE=B063R7

NODE=B063R7

→ UNCHECKED ←

[8] Statistical error only.

NODE=B063R7;LINKAGE=A

[9] Assuming $A_{1/2} = 0.115$ GeV$^{-1/2}$.

NODE=B063R7;LINKAGE=B

$\Gamma(N\eta)/\Gamma(N\pi)$ Γ_2/Γ_1

NODE=B063R13

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.99±0.05±0.19	ABLIKIM	25M	BES3	$\psi(3686) \to p\bar{p}\pi^0$, $p\bar{p}\eta$
0.95±0.03	AZNAURYAN	09	CLAS	π, η electroproduction

NODE=B063R13

$\Gamma(\Delta(1232)\pi)/\Gamma_{total}$ Γ_4/Γ

NODE=B063R10

VALUE (%)	DOCUMENT ID		TECN	COMMENT
1–4 % OUR ESTIMATE				
5 ±3	SARANTSEV	25	DPWA	Multichannel
5 ±3	SEIFEN	25	DPWA	Multichannel
3 ±1	ADAMCZEW...	20	DPWA	Multichannel
<1.1	[10] HUNT	19	DPWA	Multichannel
• • • We do not use the following data for averages, fits, limits, etc. • • •				
2.5±1.5	SOKHOYAN	15A	DPWA	Multichannel
1.8±0.8	[10] SHRESTHA	12A	DPWA	Multichannel
1 ±1	VRANA	00	DPWA	Multichannel

NODE=B063R10

→ UNCHECKED ←

[10] Statistical error only.

NODE=B063R10;LINKAGE=A

$\Gamma(N\rho, S{=}1/2)/\Gamma_{total}$ Γ_6/Γ

NODE=B063R00

VALUE (%)	DOCUMENT ID		TECN	COMMENT
2–16 % OUR ESTIMATE				
< 1	SARANTSEV	25	DPWA	Multichannel
2.7±0.6	ADAMCZEW...	20	DPWA	Multichannel
14 ±2	[11] HUNT	19	DPWA	Multichannel

NODE=B063R00

→ UNCHECKED ←

[11] Statistical error only.

NODE=B063R00;LINKAGE=A

$\Gamma(N\rho, S{=}3/2)/\Gamma_{total}$ Γ_7/Γ

NODE=B063R01

VALUE (%)	DOCUMENT ID		TECN	COMMENT
<1 % OUR ESTIMATE				
0.5±0.5	ADAMCZEW...	20	DPWA	Multichannel
<0.3	[12] HUNT	19	DPWA	Multichannel

NODE=B063R01

→ UNCHECKED ←

[12] Statistical error only.

NODE=B063R01;LINKAGE=A

$\Gamma(N\sigma)/\Gamma_{total}$ Γ_8/Γ

NODE=B063R11

VALUE (%)	DOCUMENT ID		TECN	COMMENT
2–10 % OUR ESTIMATE				
6 ±3	SARANTSEV	25	DPWA	Multichannel
4 ±2	SEIFEN	25	DPWA	Multichannel
<1	[13] HUNT	19	DPWA	Multichannel

NODE=B063R11

→ UNCHECKED ←

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

6 ±4	SOKHOYAN	15A	DPWA	Multichannel
1.5±0.5	[13] SHRESTHA	12A	DPWA	Multichannel
2 ±1	VRANA	00	DPWA	Multichannel

[13] Statistical error only.

NODE=B063R11;LINKAGE=A

$\Gamma(N(1440)\pi)/\Gamma_{total}$ Γ_9/Γ

NODE=B063R12
NODE=B063R12

VALUE (%)	DOCUMENT ID		TECN	COMMENT
5–12 % OUR ESTIMATE				→ UNCHECKED ←
6 ±5	SEIFEN	25	DPWA	Multichannel
< 0.01	[14] HUNT	19	DPWA	Multichannel
8 ±2	[14] STAROSTIN	03		$\pi^- p \to n3\pi^0$

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

12 ±8	SOKHOYAN	15A	DPWA	Multichannel
< 1	[14] SHRESTHA	12A	DPWA	Multichannel
10 ±9	VRANA	00	DPWA	Multichannel

[14] This value is an estimate made using simplest assumptions.

NODE=B063R12;LINKAGE=S

N(1535) PHOTON DECAY AMPLITUDES AT THE POLE

NODE=B063260

N(1535) → pγ, helicity-1/2 amplitude $A_{1/2}$

NODE=B063PA1
NODE=B063PA1

MODULUS ($GeV^{-1/2}$)	PHASE (°)	DOCUMENT ID		TECN	COMMENT
0.110±0.006	0 ± 5	SARANTSEV	25	DPWA	Multichannel
0.084±0.002	−12 ± 2	ROENCHEN	22	DPWA	Multichannel

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

0.106	5.2	ROENCHEN	15A	DPWA	Multichannel
0.114±0.008	10 ± 5	SOKHOYAN	15A	DPWA	Multichannel

N(1535) → nγ, helicity-1/2 amplitude $A_{1/2}$

NODE=B063A00
NODE=B063A00

MODULUS ($GeV^{-1/2}$)	PHASE (°)	DOCUMENT ID		TECN	COMMENT
−0.088±0.004	**5 ± 4**	ANISOVICH	17D	DPWA	Multichannel

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

−0.095±0.006	8 ± 5	ANISOVICH	15A	DPWA	Multichannel

N(1535) BREIT-WIGNER PHOTON DECAY AMPLITUDES

NODE=B063235

N(1535) → pγ, helicity-1/2 amplitude $A_{1/2}$

NODE=B063A1
NODE=B063A1

VALUE ($GeV^{-1/2}$)	DOCUMENT ID		TECN	COMMENT
0.090 to 0.120 (≈ 0.105) OUR ESTIMATE				→ UNCHECKED ←
0.102±0.008	SARANTSEV	25	DPWA	Multichannel
0.107±0.003	[15] HUNT	19	DPWA	Multichannel
0.091±0.004	[15] SHKLYAR	13	DPWA	Multichannel
0.128±0.004	[15] WORKMAN	12A	DPWA	$\gamma N \to N\pi$
0.091±0.002	[15] DUGGER	07	DPWA	$\gamma N \to \pi N$

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

0.101±0.007	SOKHOYAN	15A	DPWA	Multichannel
0.059±0.003	[15] SHRESTHA	12A	DPWA	Multichannel
0.066	DRECHSEL	07	DPWA	$\gamma N \to \pi N$
0.090	PENNER	02D	DPWA	Multichannel

[15] Statistical error only.

NODE=B063A1;LINKAGE=A

N(1535) → nγ, helicity-1/2 amplitude $A_{1/2}$

NODE=B063A2
NODE=B063A2

VALUE ($GeV^{-1/2}$)	DOCUMENT ID		TECN	COMMENT
−0.095 to −0.055 (≈ −0.075) OUR ESTIMATE				→ UNCHECKED ←
−0.055±0.006	[16] HUNT	19	DPWA	Multichannel
−0.081±0.006	ANISOVICH	17E	DPWA	Multichannel
−0.058±0.006	[16] CHEN	12A	DPWA	$\gamma N \to \pi N$

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

−0.093±0.011	ANISOVICH	13B	DPWA	Multichannel
−0.049±0.003	[16] SHRESTHA	12A	DPWA	Multichannel
−0.051	DRECHSEL	07	DPWA	$\gamma N \to \pi N$
−0.024	PENNER	02D	DPWA	Multichannel

[16] Statistical error only.

NODE=B063A2;LINKAGE=A

$N(1535) \rightarrow N\gamma$, ratio $A_{1/2}^n/A_{1/2}^p$

NODE=B063A3
NODE=B063A3

VALUE ($GeV^{-1/2}$)	*DOCUMENT ID*	*TECN*
• • • We do not use the following data for averages, fits, limits, etc. • • •		
-0.84 ± 0.15	MUKHOPAD... 95B	IPWA

N(1535) REFERENCES

NODE=B063

NODE=B063

For early references, see Physics Letters **111B** 1 (1982).

ABLIKIM	25M	PR D111 032011	M. Ablikim *et al.*	(BESIII Collab.)		REFID=63257
SARANTSEV	25	PR C112 015202	A.V. Sarantsev *et al.*	(Bonn-Gatchina Collab.)		REFID=63294
SEIFEN	25	EPJ A61 173	T. Seifen *et al.*	(CBELSA/TAPS Collab.)		REFID=63593
ROENCHEN	22	EPJ A58 229	D. Roenchen *et al.*	(JULI, GWU, BONN+)		REFID=61999
ADAMCZEW...	20	PR C102 024001	J. Adamczewski-Musch *et al.*	(HADES Collab.)		REFID=60589
AFZAL	20	PRL 125 152002	F. Afzal *et al.*	(CBELSA/TAPS Collab.)		REFID=60951
MUELLER	20	PL B803 135323	J. Mueller *et al.*	(CBELSA/TAPS Collab.)		REFID=60391
HUNT	19	PR C99 055205	B.C. Hunt, D.M. Manley			REFID=59985
ANISOVICH	17D	PR C95 035211	A.V. Anisovich *et al.*			REFID=58177
ANISOVICH	17E	PR C96 055202	A.V. Anisovich *et al.*	(BONN, PNPI, JLAB+)		REFID=62311
KASHEVAROV	17	PRL 118 212001	V.L. Kashevarov *et al.*	(A2/MAMI Collab.)		REFID=57930
ANISOVICH	15A	EPJ A51 72	A.V. Anisovich *et al.*			REFID=58175
ROENCHEN	15A	EPJ A51 70	D. Roenchen *et al.*			REFID=58183
SOKHOYAN	15A	EPJ A51 95	V. Sokhoyan *et al.*	(CBELSA/TAPS Collab.)		REFID=56757
PDG	14	CP C38 070001	K. Olive *et al.*	(PDG Collab.)		REFID=55687
SVARC	14	PR C89 045205	A. Svarc *et al.*	(RBI Zagreb, UNI Tuzla)		REFID=55775
ANISOVICH	13B	EPJ A49 67	A.V. Anisovich *et al.*			REFID=56147
SHKLYAR	13	PR C87 015201	V. Shklyar, H. Lenske, U. Mosel	(GIES)		REFID=55104
ANISOVICH	12A	EPJ A48 15	A.V. Anisovich *et al.*	(BONN, PNPI)		REFID=54041
CHEN	12A	PR C86 015206	W. Chen *et al.*	(DUKE, GWU, MSST, ITEP+)		REFID=54337
SHRESTHA	12A	PR C86 055203	M. Shrestha, D.M. Manley	(KSU)		REFID=54862
WORKMAN	12A	PR C86 015202	R. Workman *et al.*	(GWU)		REFID=54335
BATINIC	10	PR C82 038203	M. Batinic *et al.*	(ZAGR)		REFID=53552
AZNAURYAN	09	PR C80 055203	I.G. Aznauryan *et al.*	(JLab CLAS Collab.)		REFID=53152
DRECHSEL	07	EPJ A34 69	D. Drechsel, S.S. Kamalov, L. Tiator	(MAINZ, JINR)		REFID=52105
DUGGER	07	PR C76 025211	M. Dugger *et al.*	(JLab CLAS Collab.)		REFID=52039
ARNDT	06	PR C74 045205	R.A. Arndt *et al.*	(GWU)		REFID=51535
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