

$N(1990) F_{17}$

$$I(J^P) = \frac{1}{2}(7^+) \text{ Status: } **$$

OMITTED FROM SUMMARY TABLE

Most of the results published before 1975 are now obsolete and have been omitted. They may be found in our 1982 edition, Physics Letters **111B** (1982).

The various analyses do not agree very well with one another.

 $N(1990)$ BREIT-WIGNER MASS

<u>VALUE (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
≈ 1990 OUR ESTIMATE			
2086 ± 28	MANLEY	92	IPWA $\pi N \rightarrow \pi N$ & $N\pi\pi$
2018	CRAWFORD	80	DPWA $\gamma N \rightarrow \pi N$
1970 ± 50	CUTKOSKY	80	IPWA $\pi N \rightarrow \pi N$
2005 ± 150	HOEHLER	79	IPWA $\pi N \rightarrow \pi N$
1999	BARBOUR	78	DPWA $\gamma N \rightarrow \pi N$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
2311 ± 16	VRANA	00	DPWA Multichannel

 $N(1990)$ BREIT-WIGNER WIDTH

<u>VALUE (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
535 ± 120	MANLEY	92	IPWA $\pi N \rightarrow \pi N$ & $N\pi\pi$
295	CRAWFORD	80	DPWA $\gamma N \rightarrow \pi N$
350 ± 120	CUTKOSKY	80	IPWA $\pi N \rightarrow \pi N$
350 ± 100	HOEHLER	79	IPWA $\pi N \rightarrow \pi N$
216	BARBOUR	78	DPWA $\gamma N \rightarrow \pi N$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
205 ± 72	VRANA	00	DPWA Multichannel

 $N(1990)$ POLE POSITION**REAL PART**

<u>VALUE (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
1900 ± 30	CUTKOSKY	80	IPWA $\pi N \rightarrow \pi N$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
2301	VRANA	00	DPWA Multichannel
not seen	ARNDT	91	DPWA $\pi N \rightarrow \pi N$ Soln SM90

−2×IMAGINARY PART

<u>VALUE (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
260 ± 60	CUTKOSKY	80	IPWA $\pi N \rightarrow \pi N$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
202	VRANA	00	DPWA Multichannel
not seen	ARNDT	91	DPWA $\pi N \rightarrow \pi N$ Soln SM90

$N(1990)$ ELASTIC POLE RESIDUE**MODULUS $|r|$**

<u>VALUE (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
9 ± 3	CUTKOSKY	80	IPWA $\pi N \rightarrow \pi N$

PHASE θ

<u>VALUE ($^\circ$)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
-60 ± 30	CUTKOSKY	80	IPWA $\pi N \rightarrow \pi N$

 $N(1990)$ DECAY MODES

Mode
Γ_1 $N\pi$
Γ_2 $N\eta$
Γ_3 ΛK
Γ_4 ΣK
Γ_5 $N\pi\pi$
Γ_6 $p\gamma$, helicity=1/2
Γ_7 $p\gamma$, helicity=3/2
Γ_8 $n\gamma$, helicity=1/2
Γ_9 $n\gamma$, helicity=3/2

 $N(1990)$ BRANCHING RATIOS

$\Gamma(N\pi)/\Gamma_{\text{total}}$	Γ_1/Γ		
<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
0.06 ± 0.02	MANLEY	92	IPWA $\pi N \rightarrow \pi N$ & $N\pi\pi$
0.06 ± 0.02	CUTKOSKY	80	IPWA $\pi N \rightarrow \pi N$
0.04 ± 0.02	HOEHLER	79	IPWA $\pi N \rightarrow \pi N$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
0.22 ± 0.11	VRANA	00	DPWA Multichannel

$(\Gamma_i \Gamma_f)^{1/2}/\Gamma_{\text{total}}$ in $N\pi \rightarrow N(1990) \rightarrow N\eta$	$(\Gamma_1 \Gamma_2)^{1/2}/\Gamma$		
<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
-0.043	BAKER	79	DPWA $\pi^- p \rightarrow n\eta$

$\Gamma(N\eta)/\Gamma_{\text{total}}$	Γ_2/Γ		
<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
0.00 ± 0.01	VRANA	00	DPWA Multichannel

$(\Gamma_i \Gamma_f)^{1/2}/\Gamma_{\text{total}}$ in $N\pi \rightarrow N(1990) \rightarrow \Lambda K$	$(\Gamma_1 \Gamma_3)^{1/2}/\Gamma$		
<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
$+0.01$	BELL	83	DPWA $\pi^- p \rightarrow \Lambda K^0$
not seen	SAXON	80	DPWA $\pi^- p \rightarrow \Lambda K^0$
-0.021 ± 0.033	DEVENISH	74B	Fixed- t dispersion rel.

$(\Gamma_i \Gamma_f)^{1/2} / \Gamma_{\text{total}}$ in $N\pi \rightarrow N(1990) \rightarrow \Sigma K$				$(\Gamma_1 \Gamma_4)^{1/2} / \Gamma$
VALUE	DOCUMENT ID	TECN	COMMENT	
0.010 to 0.023	¹ DEANS	75	DPWA	$\pi N \rightarrow \Sigma K$
0.06	LANGBEIN	73	IPWA	$\pi N \rightarrow \Sigma K$ (sol. 1)

$(\Gamma_i \Gamma_f)^{1/2} / \Gamma_{\text{total}}$ in $N\pi \rightarrow N(1990) \rightarrow N\pi\pi$				$(\Gamma_1 \Gamma_5)^{1/2} / \Gamma$
VALUE	DOCUMENT ID	TECN	COMMENT	
not seen	LONGACRE	75	IPWA	$\pi N \rightarrow N\pi\pi$

$N(1990)$ PHOTON DECAY AMPLITUDES

$N(1990) \rightarrow p\gamma$, helicity-1/2 amplitude $A_{1/2}$

VALUE ($\text{GeV}^{-1/2}$)	DOCUMENT ID	TECN	COMMENT
0.030 ± 0.029	AWAJI	81	DPWA $\gamma N \rightarrow \pi N$
0.001 ± 0.040	CRAWFORD	80	DPWA $\gamma N \rightarrow \pi N$
• • • We do not use the following data for averages, fits, limits, etc. • • •			
0.040	BARBOUR	78	DPWA $\gamma N \rightarrow \pi N$

$N(1990) \rightarrow p\gamma$, helicity-3/2 amplitude $A_{3/2}$

VALUE ($\text{GeV}^{-1/2}$)	DOCUMENT ID	TECN	COMMENT
0.086 ± 0.060	AWAJI	81	DPWA $\gamma N \rightarrow \pi N$
0.004 ± 0.025	CRAWFORD	80	DPWA $\gamma N \rightarrow \pi N$
• • • We do not use the following data for averages, fits, limits, etc. • • •			
+0.004	BARBOUR	78	DPWA $\gamma N \rightarrow \pi N$

$N(1990) \rightarrow n\gamma$, helicity-1/2 amplitude $A_{1/2}$

VALUE ($\text{GeV}^{-1/2}$)	DOCUMENT ID	TECN	COMMENT
-0.001	AWAJI	81	DPWA $\gamma N \rightarrow \pi N$
-0.078 ± 0.030	CRAWFORD	80	DPWA $\gamma N \rightarrow \pi N$
• • • We do not use the following data for averages, fits, limits, etc. • • •			
-0.069	BARBOUR	78	DPWA $\gamma N \rightarrow \pi N$

$N(1990) \rightarrow n\gamma$, helicity-3/2 amplitude $A_{3/2}$

VALUE ($\text{GeV}^{-1/2}$)	DOCUMENT ID	TECN	COMMENT
-0.178	AWAJI	81	DPWA $\gamma N \rightarrow \pi N$
-0.116 ± 0.045	CRAWFORD	80	DPWA $\gamma N \rightarrow \pi N$
• • • We do not use the following data for averages, fits, limits, etc. • • •			
-0.072	BARBOUR	78	DPWA $\gamma N \rightarrow \pi N$

$N(1990)$ FOOTNOTES

¹ The range given for DEANS 75 is from the four best solutions.

N(1990) REFERENCES

For early references, see Physics Letters **111B** 70 (1982).

VRANA	00	PRPL 328 181	T.P. Vrana, S.A. Dytman,, T.-S.H. Lee	(PITT+)
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)
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
PDG	82	PL 111B	M. Roos <i>et al.</i>	(HELS, CIT, CERN)
AWAJI	81	Bonn Conf. 352	N. Awaji, R. Kajikawa	(NAGO)
Also		NP B197 365	K. Fujii <i>et al.</i>	(NAGO)
CRAWFORD	80	Toronto Conf. 107	R.L. Crawford	(GLAS)
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
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
BARBOUR	78	NP B141 253	I.M. Barbour, R.L. Crawford, N.H. Parsons	(GLAS)
DEANS	75	NP B96 90	S.R. Deans <i>et al.</i>	(SFLA, ALAH) IJP
LONGACRE	75	PL 55B 415	R.S. Longacre <i>et al.</i>	(LBL, SLAC) IJP
DEVENISH	74B	NP B81 330	R.C.E. Devenish, C.D. Froggatt, B.R. Martin	(DESY+)
LANGBEIN	73	NP B53 251	W. Langbein, F. Wagner	(MUNI) IJP
