−2×IMAGINARY PART

VALUE (MeV)	DOCUMENT ID		TECN	COMMENT
350±100	CUTKOSKY	80	IPWA	$\pi N \rightarrow \pi N$
139 or 131	[1] LONGACRE	78	IPWA	$\pi N \rightarrow N\pi\pi$

$N(2090)$ ELASTIC POLE RESIDUE

MODULUS $|r|$

VALUE (MeV)	DOCUMENT ID		TECN	COMMENT
40±20	CUTKOSKY	80	IPWA	$\pi N \rightarrow \pi N$

PHASE θ

VALUE (°)	DOCUMENT ID		TECN	COMMENT
0±90	CUTKOSKY	80	IPWA	$\pi N \rightarrow \pi N$

$N(2090)$ DECAY MODES

	Mode
Γ_1	$N\pi$
Γ_2	ΛK
Γ_3	$N\pi\pi$

$N(2090)$ BRANCHING RATIOS

$\Gamma(N\pi)/\Gamma_{total}$ Γ_1/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
0.10±0.10	MANLEY	92	IPWA	$\pi N \rightarrow \pi N$ & $N\pi\pi$
0.18±0.08	CUTKOSKY	80	IPWA	$\pi N \rightarrow \pi N$
0.09±0.05	HOEHLER	79	IPWA	$\pi N \rightarrow \pi N$

$(\Gamma_i\Gamma_f)^{1/2}/\Gamma_{total}$ in $N\pi \rightarrow N(2090) \rightarrow \Lambda K$ $(\Gamma_1\Gamma_2)^{1/2}/\Gamma$

VALUE	DOCUMENT ID		TECN	COMMENT
not seen	SAXON	80	DPWA	$\pi^- p \rightarrow \Lambda K^0$

$N(2090)$ FOOTNOTES

[1] LONGACRE 78 values are from a search for poles in the unitarized T-matrix. The first (second) value uses, in addition to $\pi N \rightarrow N\pi\pi$ data, elastic amplitudes from a Saclay (CERN) partial-wave analysis.

$N(2090)$ REFERENCES

MANLEY	92	PR D45 4002	+Saleski	(KENT) IJP
Also	84	PR D30 904	Manley, Arndt, Goradia, Teplitz	(VPI)
CUTKOSKY	80	Toronto Conf. 19	+Forsyth, Babcock, Kelly, Hendrick	(CMU, LBL) IJP
Also	79	PR D20 2839	Cutkosky, Forsyth, Hendrick, Kelly	(CMU, LBL)
SAXON	80	NP B162 522	+Baker, Bell, Blissett, Bloodworth+	(RHEL, BRIS) IJP
HOEHLER	79	PDAT 12-1	+Kaiser, Koch, Pietarinen	(KARLT) IJP
Also	80	Toronto Conf. 3	Koch	(KARLT) IJP
LONGACRE	78	PR D17 1795	+Lasinski, Rosenfeld, Smadja+	(LBL, SLAC)

$N(2100)$ P_{11}

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

OMITTED FROM SUMMARY TABLE

$N(2100)$ MASS

VALUE (MeV)	DOCUMENT ID		TECN	COMMENT
≈ 2100 OUR ESTIMATE				
1885±30	MANLEY	92	IPWA	$\pi N \rightarrow \pi N$ & $N\pi\pi$
2125±75	CUTKOSKY	80	IPWA	$\pi N \rightarrow \pi N$
2050±20	HOEHLER	79	IPWA	$\pi N \rightarrow \pi N$

$N(2100)$ WIDTH

VALUE (MeV)	DOCUMENT ID		TECN	COMMENT
113± 44	MANLEY	92	IPWA	$\pi N \rightarrow \pi N$ & $N\pi\pi$
260±100	CUTKOSKY	80	IPWA	$\pi N \rightarrow \pi N$
200± 30	HOEHLER	79	IPWA	$\pi N \rightarrow \pi N$

$N(2100)$ POLE POSITION

REAL PART

VALUE (MeV)	DOCUMENT ID		TECN	COMMENT
2120±40	CUTKOSKY	80	IPWA	$\pi N \rightarrow \pi N$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
not seen	ARNDT	91	DPWA	$\pi N \rightarrow \pi N$ Soln SM90

−2×IMAGINARY PART

VALUE (MeV)	DOCUMENT ID		TECN	COMMENT
240±80	CUTKOSKY	80	IPWA	$\pi N \rightarrow \pi N$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
not seen	ARNDT	91	DPWA	$\pi N \rightarrow \pi N$ Soln SM90

$N(2100)$ ELASTIC POLE RESIDUE

MODULUS $|r|$

VALUE (MeV)	DOCUMENT ID		TECN	COMMENT
14±7	CUTKOSKY	80	IPWA	$\pi N \rightarrow \pi N$

PHASE θ

VALUE (°)	DOCUMENT ID		TECN	COMMENT
35±25	CUTKOSKY	80	IPWA	$\pi N \rightarrow \pi N$

$N(2100)$ DECAY MODES

	Mode
Γ_1	$N\pi$
Γ_2	$N\pi\pi$
Γ_3	$\Delta(1232)\pi$, P-wave

$N(2100)$ BRANCHING RATIOS

$\Gamma(N\pi)/\Gamma_{total}$ Γ_1/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
0.15±0.06	MANLEY	92	IPWA	$\pi N \rightarrow \pi N$ & $N\pi\pi$
0.12±0.03	CUTKOSKY	80	IPWA	$\pi N \rightarrow \pi N$
0.10±0.04	HOEHLER	79	IPWA	$\pi N \rightarrow \pi N$

$(\Gamma_i\Gamma_f)^{1/2}/\Gamma_{total}$ in $N\pi \rightarrow N(2100) \rightarrow \Delta(1232)\pi$, P-wave $(\Gamma_1\Gamma_3)^{1/2}/\Gamma$

VALUE	DOCUMENT ID		TECN	COMMENT
−0.19±0.08	MANLEY	92	IPWA	$\pi N \rightarrow \pi N$ & $N\pi\pi$

$N(2100)$ REFERENCES

MANLEY	92	PR D45 4002	+Saleski	(KENT) IJP
Also	84	PR D30 904	Manley, Arndt, Goradia, Teplitz	(VPI)
ARNDT	91	PR D43 2131	+Li, Roper, Workman, Ford	(VPI, TELE) IJP
CUTKOSKY	80	Toronto Conf. 19	+Forsyth, Babcock, Kelly, Hendrick	(CMU, LBL) IJP
Also	79	PR D20 2839	Cutkosky, Forsyth, Hendrick, Kelly	(CMU, LBL)
HOEHLER	79	PDAT 12-1	+Kaiser, Koch, Pietarinen	(KARLT) IJP
Also	80	Toronto Conf. 3	Koch	(KARLT) IJP

$N(2190)$ G_{17}

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

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).

$N(2190)$ MASS

VALUE (MeV)	DOCUMENT ID		TECN	COMMENT
2100 to 2200 (≈ 2190) OUR ESTIMATE				
2127± 9	MANLEY	92	IPWA	$\pi N \rightarrow \pi N$ & $N\pi\pi$
2200±70	CUTKOSKY	80	IPWA	$\pi N \rightarrow \pi N$
2140±12	HOEHLER	79	IPWA	$\pi N \rightarrow \pi N$
2140±40	HENDRY	78	MPWA	$\pi N \rightarrow \pi N$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
2098	CRAWFORD	80	DPWA	$\gamma N \rightarrow \pi N$
2180	SAXON	80	DPWA	$\pi^- p \rightarrow \Lambda K^0$
2140	BAKER	79	DPWA	$\pi^- p \rightarrow n\eta$
2117	BARBOUR	78	DPWA	$\gamma N \rightarrow \pi N$

$N(2190)$ WIDTH

VALUE (MeV)	DOCUMENT ID		TECN	COMMENT
350 to 550 (≈ 450) OUR ESTIMATE				
550± 50	MANLEY	92	IPWA	$\pi N \rightarrow \pi N$ & $N\pi\pi$
500±150	CUTKOSKY	80	IPWA	$\pi N \rightarrow \pi N$
390± 30	HOEHLER	79	IPWA	$\pi N \rightarrow \pi N$
270± 50	HENDRY	78	MPWA	$\pi N \rightarrow \pi N$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
238	CRAWFORD	80	DPWA	$\gamma N \rightarrow \pi N$
80	SAXON	80	DPWA	$\pi^- p \rightarrow \Lambda K^0$
319	BAKER	79	DPWA	$\pi^- p \rightarrow n\eta$
220	BARBOUR	78	DPWA	$\gamma N \rightarrow \pi N$

$N(2190)$ POLE POSITION

REAL PART

VALUE (MeV)	DOCUMENT ID		TECN	COMMENT
2042	[1] HOEHLER	93	SPED	$\pi N \rightarrow \pi N$
2060	ARNDT	91	DPWA	$\pi N \rightarrow \pi N$ Soln SM90
2100±50	CUTKOSKY	80	IPWA	$\pi N \rightarrow \pi N$