$N(2090)\ S_{11}$

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

OMITTED FROM SUMMARY TABLE

Any structure in the S_{11} wave above 1800 MeV is listed here. A few early results that are now obsolete have been omitted.

N(2090) BREIT-WIGNER MASS

VALUE (MeV)	DOCUMENT ID		TECN	COMMENT
≈ 2090 OUR ESTIMATE				
1928±59	MANLEY	92	IPWA	$\pi N \to \pi N$ & $N\pi\pi$
2180±80	CUTKOSKY	80	IPWA	$\pi N \to \pi N$
1880±20	HOEHLER	79	IPWA	$\pi N \to \pi N$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
1822±43	VRANA	00	DPWA	Multichannel
$1897\pm50^{+30}_{-\ 2}$	PLOETZKE	98	SPEC	$\gamma p \to p\eta'(958)$

N(2090) BREIT-WIGNER WIDTH

VALUE (MeV)	DOCUMENT ID		TECN	COMMENT
414±157	MANLEY	92	IPWA	$\pi N \to \pi N$ & $N\pi\pi$
350±100	CUTKOSKY	80	IPWA	$\pi N \to \pi N$
95± 30	HOEHLER	79	IPWA	$\pi N \to \pi N$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
248±185	VRANA	00	DPWA	Multichannel
$396\pm155^{+35}_{-45}$	PLOETZKE	98	SPEC	$\gamma p \to p\eta'(958)$

N(2090) POLE POSITION

REAL PART

VALUE (MeV)	DOCUMENT ID		TECN	COMMENT
2150±70	CUTKOSKY	80	IPWA	$\pi N \to \pi N$
1937 or 1949	[1] LONGACRE	78	IPWA	$\pi N \to N\pi\pi$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
1795	VRANA	00	DPWA	Multichannel

−2×IMAGINARY PART

VALUE (MeV)	DOCUMENT ID		TECN	COMMENT
350±100	CUTKOSKY	80	IPWA	$\pi N \to \pi N$
139 or 131	[1] LONGACRE	78	IPWA	$\pi N \to N\pi\pi$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
220	VRANA	00	DPWA	Multichannel

$N(2090)$ ELASTIC POLE RESIDUE

MODULUS $|r|$

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

PHASE θ

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

$N(2090)$ DECAY MODES

	Mode
Γ_1	$N\pi$
Γ_2	$N\eta$
Γ_3	ΛK
Γ_4	$N\pi\pi$
Γ_5	$\Delta\pi$
Γ_6	$\Delta(1232)\pi$, D-wave
Γ_7	$N\rho$
Γ_8	$N\rho$, S=1/2, S-wave
Γ_9	$N\rho$, S=3/2, D-wave
Γ_{10}	$N(\pi\pi)^{I=0}_{S\text{-wave}}$
Γ_{11}	$N(1440)\pi$

$N(2090)$ BRANCHING RATIOS

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

VALUE	DOCUMENT ID		TECN	COMMENT
0.10 ± 0.10	MANLEY	92	IPWA	$\pi N \to \pi N$ & $N\pi\pi$
0.18 ± 0.08	CUTKOSKY	80	IPWA	$\pi N \to \pi N$
0.09 ± 0.05	HOEHLER	79	IPWA	$\pi N \to \pi N$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.17 ± 0.03	VRANA	00	DPWA	Multichannel

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

VALUE	DOCUMENT ID		TECN	COMMENT
0.41 ± 0.04	VRANA	00	DPWA	Multichannel

$(\Gamma_i\Gamma_f)^{1/2}/\Gamma_{\text{total}}$ in $N\pi \to N(2090) \to \Lambda K$ — $(\Gamma_1\Gamma_3)^{1/2}/\Gamma$

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

$\Gamma(\Delta(1232)\pi$, D-wave$)/\Gamma_{\text{total}}$ — Γ_6/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
0.01 ± 0.01	VRANA	00	DPWA	Multichannel

$\Gamma(N\rho, S{=}1/2, S\text{-wave})/\Gamma_{\text{total}}$ — Γ_8/Γ

VALUE	*DOCUMENT ID*		*TECN*	*COMMENT*
0.36 ± 0.01	VRANA	00	DPWA	Multichannel

$\Gamma(N\rho, S{=}3/2, D\text{-wave})/\Gamma_{\text{total}}$ — Γ_9/Γ

VALUE	*DOCUMENT ID*		*TECN*	*COMMENT*
0.01 ± 0.01	VRANA	00	DPWA	Multichannel

$\Gamma(N(\pi\pi)^{I=0}_{S\text{-wave}})/\Gamma_{\text{total}}$ — Γ_{10}/Γ

VALUE	*DOCUMENT ID*		*TECN*	*COMMENT*
0.02 ± 0.01	VRANA	00	DPWA	Multichannel

$\Gamma(N(1440)\pi)/\Gamma_{\text{total}}$ — Γ_{11}/Γ

VALUE	*DOCUMENT ID*		*TECN*	*COMMENT*
0.02 ± 0.01	VRANA	00	DPWA	Multichannel

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

VRANA	00	PRPL 328 181	T.P. Vrana, S.A. Dytman,, T.-S.H. Lee	(PITT+)
PLOETZKE	98	PL B444 555	R. Ploetzke *et al.*	(Bonn SAPHIR Collab.)
MANLEY	92	PR D45 4002	D.M. Manley, E.M. Saleski	(KENT) IJP
Also	84	PR D30 904	D.M. Manley *et al.*	(VPI)
CUTKOSKY	80	Toronto Conf. 19	R.E. Cutkosky *et al.*	(CMU, LBL) IJP
Also	79	PR D20 2839	R.E. Cutkosky *et al.*	(CMU, LBL)
SAXON	80	NP B162 522	D.H. Saxon *et al.*	(RHEL, BRIS) IJP
HOEHLER	79	PDAT 12-1	G. Hohler *et al.*	(KARLT) IJP
Also	80	Toronto Conf. 3	R. Koch	(KARLT) IJP
LONGACRE	78	PR D17 1795	R.S. Longacre *et al.*	(LBL, SLAC)