$\Delta(1232)^+$ WIDTH

VALUE (MeV)	DOCUMENT ID		TECN	COMMENT
131.1±2.4	MIROSHNIC...	79		Fit photoproduction
• • • We do not use the following data for averages, fits, limits, etc. • • •				
111.2	CRAWFORD	80	DPWA	$\gamma N \to \pi N$
111.0	BARBOUR	78	DPWA	$\gamma N \to \pi N$

$\Delta(1232)^0$ WIDTH

VALUE (MeV)	DOCUMENT ID		TECN	COMMENT
113.0±1.5	KOCH	80B	IPWA	$\pi N \to \pi N$
121.3±0.4	ZIDELL	80	DPWA	$\pi N \to \pi N$ 0–350 MeV
117.9±0.9	PEDRONI	78		$\pi N \to \pi N$ 70–370 MeV

Δ^0-Δ^{++} WIDTH DIFFERENCE

VALUE (MeV)	DOCUMENT ID		COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •			
6.6±1.0	PEDRONI	78	See the widths

$\Delta(1232)$ POLE POSITIONS

REAL PART, MIXED CHARGES

VALUE (MeV)	DOCUMENT ID		TECN	COMMENT
1209	[2] HOEHLER	93	ARGD	$\pi N \to \pi N$
1210	ARNDT	91	DPWA	$\pi N \to \pi N$ Soln SM90
1210±1	CUTKOSKY	80	IPWA	$\pi N \to \pi N$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
1210	ARNDT	85	DPWA	See ARNDT 91

−IMAGINARY PART, MIXED CHARGES

VALUE (MeV)	DOCUMENT ID		TECN	COMMENT
100	[2] HOEHLER	93	ARGD	$\pi N \to \pi N$
50	ARNDT	91	DPWA	$\pi N \to \pi N$ Soln SM90
50±1	CUTKOSKY	80	IPWA	$\pi N \to \pi N$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
50	ARNDT	85	DPWA	See ARNDT 91

REAL PART, $\Delta(1232)^{++}$

VALUE (MeV)	DOCUMENT ID		TECN	COMMENT
1210.70±0.16	[3] ZIDELL	80	DPWA	$\pi N \to \pi N$ 0–350 MeV
1209.6 ±0.5	[4] VASAN	76B		Fit to CARTER 73
• • • We do not use the following data for averages, fits, limits, etc. • • •				
1210.4 ±0.17	[5] ZIDELL	78		
1210.5 to 1210.8	[6] VASAN	76B		Fit to CARTER 73

−IMAGINARY PART, $\Delta(1232)^{++}$

VALUE (MeV)	DOCUMENT ID		TECN	COMMENT
49.61 ±0.12	[3] ZIDELL	80	DPWA	$\pi N \to \pi N$ 0–350 MeV
50.4 ±0.5	[4] VASAN	76B		Fit to CARTER 73
• • • We do not use the following data for averages, fits, limits, etc. • • •				
49.745±0.14	[5] ZIDELL	78		
49.9 to 50.0	[6] VASAN	76B		Fit to CARTER 73

REAL PART, $\Delta(1232)^+$

VALUE (MeV)	DOCUMENT ID		COMMENT
1206.9±0.9 to 1210.5 ± 1.8	MIROSHNIC...	79	Fit photoproduction
1208.0±2.0	CAMPBELL	76	Fit photoproduction

−IMAGINARY PART, $\Delta(1232)^+$

VALUE (MeV)	DOCUMENT ID		COMMENT
55.6±1.0 to 58.3 ± 1.1	MIROSHNIC...	79	Fit photoproduction
53.0±2.0	CAMPBELL	76	Fit photoproduction

REAL PART, $\Delta(1232)^0$

VALUE (MeV)	DOCUMENT ID		TECN	COMMENT
1210.30±0.36	[3] ZIDELL	80	DPWA	$\pi N \to \pi N$ 0–350 MeV
1210.75±0.6	[4] VASAN	76B		Fit to CARTER 73
• • • We do not use the following data for averages, fits, limits, etc. • • •				
1209.5 ±0.41	[5] ZIDELL	78		
1210.2	[6] VASAN	76B		Fit to CARTER 73

−IMAGINARY PART, $\Delta(1232)^0$

VALUE (MeV)	DOCUMENT ID		TECN	COMMENT
54.0 ±0.26	[3] ZIDELL	80	DPWA	$\pi N \to \pi N$ 0–350 MeV
52.8 ±0.6	[4] VASAN	76B		Fit to CARTER 73
• • • We do not use the following data for averages, fits, limits, etc. • • •				
52.45±0.2	[5] ZIDELL	78		
52.9 to 53.1	[6] VASAN	76B		Fit to CARTER 73

$\Delta(1232)$ ELASTIC POLE RESIDUES

ABSOLUTE VALUE, MIXED CHARGES

VALUE (MeV)	DOCUMENT ID		TECN	COMMENT
50	HOEHLER	93	ARGD	$\pi N \to \pi N$
52	ARNDT	91	DPWA	$\pi N \to \pi N$ Soln SM90
53±2	CUTKOSKY	80	IPWA	$\pi N \to \pi N$

PHASE, MIXED CHARGES

VALUE (°)	DOCUMENT ID		TECN	COMMENT
−48	HOEHLER	93	ARGD	$\pi N \to \pi N$
−31	ARNDT	91	DPWA	$\pi N \to \pi N$ Soln SM90
−47±1	CUTKOSKY	80	IPWA	$\pi N \to \pi N$

ABSOLUTE VALUE, $\Delta(1232)^{++}$

VALUE (MeV)	DOCUMENT ID		COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •			
52.4 to 53.2	[4] VASAN	76B	Fit to CARTER 73
52.1 to 52.4	[6] VASAN	76B	Fit to CARTER 73

PHASE, $\Delta(1232)^{++}$

VALUE (rad)	DOCUMENT ID		COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •			
−0.822 to −0.833	[4] VASAN	76B	Fit to CARTER 73
−0.823 to −0.830	[6] VASAN	76B	Fit to CARTER 73

ABSOLUTE VALUE, $\Delta(1232)^0$

VALUE (MeV)	DOCUMENT ID		COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •			
54.8 to 55.0	[4] VASAN	76B	Fit to CARTER 73
55.2 to 55.3	[6] VASAN	76B	Fit to CARTER 73

PHASE, $\Delta(1232)^0$

VALUE (rad)	DOCUMENT ID		COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •			
−0.840 to −0.847	[4] VASAN	76B	Fit to CARTER 73
−0.848 to −0.856	[6] VASAN	76B	Fit to CARTER 73

$\Delta(1232)$ DECAY MODES

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

	Mode	Fraction (Γ_i/Γ)
Γ_1	$N\pi$	>99 %
Γ_2	$N\gamma$	0.55–0.61 %
Γ_3	$N\gamma$, helicity=1/2	
Γ_4	$N\gamma$, helicity=3/2	

$\Delta(1232)$ BRANCHING RATIOS

$\Gamma(N\pi)/\Gamma_{total}$ — Γ_1/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
0.993 to 0.995 OUR ESTIMATE				
1.0	MANLEY	92	IPWA	$\pi N \to \pi N$ & $N\pi\pi$
1.0	CUTKOSKY	80	IPWA	$\pi N \to \pi N$
1.0	HOEHLER	79	IPWA	$\pi N \to \pi N$

$\Delta(1232)$ PHOTON DECAY AMPLITUDES

$\Delta(1232) \to N\gamma$, helicity-1/2 amplitude $A_{1/2}$

VALUE (GeV$^{-1/2}$)	DOCUMENT ID		TECN	COMMENT
−0.141±0.005 OUR ESTIMATE				
−0.143±0.004	LI	93	IPWA	$\gamma N \to \pi N$
−0.135±0.016	DAVIDSON	91B	FIT	$\gamma N \to \pi N$
−0.145±0.015	CRAWFORD	83	IPWA	$\gamma N \to \pi N$
−0.138±0.004	AWAJI	81	DPWA	$\gamma N \to \pi N$
−0.147±0.001	ARAI	80	DPWA	$\gamma N \to \pi N$ (fit 1)
−0.145±0.001	ARAI	80	DPWA	$\gamma N \to \pi N$ (fit 2)
−0.136±0.006	CRAWFORD	80	DPWA	$\gamma N \to \pi N$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
−0.133±0.007	ARNDT	90B	IPWA	See LI 93
−0.137	ARNDT	90B	FIT	See LI 93
−0.140±0.007	DAVIDSON	90	FIT	See DAVIDSON 91B
−0.142±0.007	BARBOUR	78	DPWA	$\gamma N \to \pi N$
−0.140	[7] NOELLE	78		$\gamma N \to \pi N$
−0.141±0.004	FELLER	76	DPWA	$\gamma N \to \pi N$