$\Xi(1530)$ P_{13}

$I(J^P) = \frac{1}{2}(\frac{3}{2}^+)$ Status: ∗∗∗∗

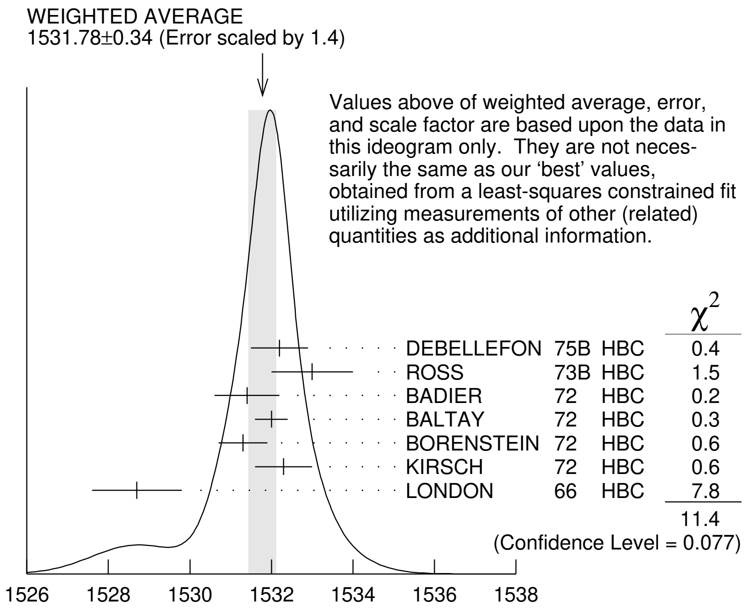
This is the only Ξ resonance whose properties are all reasonably well known. Spin-parity $3/2^+$ is favored by the data.

We use only those determinations of the mass and width that are accompanied by some discussion of systematics and resolution.

$\Xi(1530)$ MASSES

$\Xi(1530)^0$ MASS

VALUE (MeV)	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
1531.80±0.32 OUR FIT Error includes scale factor of 1.3.					
1531.78±0.34 OUR AVERAGE Error includes scale factor of 1.4. See the ideogram below.					
1532.2 ±0.7		DEBELLEFON	75B	HBC	$K^- p \rightarrow \Xi^- \overline{K} \pi$
1533 ±1		ROSS	73B	HBC	$K^- p \rightarrow \Xi \overline{K} \pi(\pi)$
1531.4 ±0.8	59	BADIER	72	HBC	$K^- p$ 3.95 GeV/c
1532.0 ±0.4	1262	BALTAY	72	HBC	$K^- p$ 1.75 GeV/c
1531.3 ±0.6	324	BORENSTEIN	72	HBC	$K^- p$ 2.2 GeV/c
1532.3 ±0.7	286	KIRSCH	72	HBC	$K^- p$ 2.87 GeV/c
1528.7 ±1.1	76	LONDON	66	HBC	$K^- p$ 2.24 GeV/c
• • • We do not use the following data for averages, fits, limits, etc. • • •					
1532.1 ±0.4	1244	ASTON	85B	LASS	$K^- p$ 11 GeV/c
1532.1 ±0.6	2700	[1] BAUBILLIER	81B	HBC	$K^- p$ 8.25 GeV/c
1530 ±1	450	BIAGI	81	SPEC	SPS hyperon beam
1527 ±6	80	SIXEL	79	HBC	$K^- p$ 10 GeV/c
1535 ±4	100	SIXEL	79	HBC	$K^- p$ 16 GeV/c
1533.6 ±1.4	97	BERTHON	74	HBC	Quasi-2-body σ



$\Xi(1530)^0$ mass (MeV)

$\Xi(1530)^-$ MASS

VALUE (MeV)	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
1535.0±0.6 OUR FIT					
1535.2±0.8 OUR AVERAGE					
1534.5±1.2		DEBELLEFON	75B	HBC	$K^- p \rightarrow \Xi^- \overline{K} \pi$
1535.3±2.0		ROSS	73B	HBC	$K^- p \rightarrow \Xi \overline{K} \pi(\pi)$
1536.2±1.6	185	KIRSCH	72	HBC	$K^- p$ 2.87 GeV/c
1535.7±3.2	38	LONDON	66	HBC	$K^- p$ 2.24 GeV/c
• • • We do not use the following data for averages, fits, limits, etc. • • •					
1540 ±3	48	BERTHON	74	HBC	Quasi-2-body σ
1534.7±1.1	334	BALTAY	72	HBC	$K^- p$ 1.75 GeV/c

$m_{\Xi(1530)^-} - m_{\Xi(1530)}$

VALUE (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
3.2±0.6 OUR FIT				
2.9±0.9 OUR AVERAGE				
2.7±1.0	BALTAY	72	HBC	$K^- p$ 1.75 GeV/c
2.0±3.2	MERRILL	66	HBC	$K^- p$ 1.7–2.7 GeV/c
5.7±3.0	PJERROU	65B	HBC	$K^- p$ 1.8–1.95 GeV/c
• • • We do not use the following data for averages, fits, limits, etc. • • •				
3.9±1.8	[2] KIRSCH	72	HBC	$K^- p$ 2.87 GeV/c
7 ±4	[2] LONDON	66	HBC	$K^- p$ 2.24 GeV/c

$\Xi(1530)$ WIDTHS

$\Xi(1530)^0$ WIDTH

VALUE (MeV)	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
9.1±0.5 OUR AVERAGE					
9.5±1.2		DEBELLEFON	75B	HBC	$K^- p \to \Xi^- \overline{K} \pi$
9.1±2.4		ROSS	73B	HBC	$K^- p \to \Xi \overline{K} \pi(\pi)$
11 ±2		BADIER	72	HBC	$K^- p$ 3.95 GeV/c
9.0±0.7		BALTAY	72	HBC	$K^- p$ 1.75 GeV/c
8.4±1.4		BORENSTEIN	72	HBC	$\Xi^- \pi^+$
11.0±1.8		KIRSCH	72	HBC	$\Xi^- \pi^+$
7 ±7		BERGE	66	HBC	$K^- p$ 1.5–1.7 GeV/c
8.5±3.5		LONDON	66	HBC	$K^- p$ 2.24 GeV/c
7 ±2		SCHLEIN	63B	HBC	$K^- p$ 1.8, 1.95 GeV/c
• • • We do not use the following data for averages, fits, limits, etc. • • •					
12.8±1.0	2700	[1] BAUBILLIER	81B	HBC	$K^- p$ 8.25 GeV/c
19 ±6	80	[3] SIXEL	79	HBC	$K^- p$ 10 GeV/c
14 ±5	100	[3] SIXEL	79	HBC	$K^- p$ 16 GeV/c

$\Xi(1530)^-$ WIDTH

VALUE (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
$9.9^{+1.7}_{-1.9}$ OUR AVERAGE				
9.6±2.8	DEBELLEFON	75B	HBC	$K^- p \to \Xi^- \overline{K} \pi$
8.3±3.6	ROSS	73B	HBC	$K^- p \to \Xi \overline{K} \pi(\pi)$
$7.8^{+3.5}_{-7.8}$	BALTAY	72	HBC	$K^- p$ 1.75 GeV/c
16.2±4.6	KIRSCH	72	HBC	$\Xi^- \pi^0$, $\Xi^0 \pi^-$

$\Xi(1530)$ POLE POSITIONS

$\Xi(1530)^0$ REAL PART

VALUE	*DOCUMENT ID*		*COMMENT*
1531.6±0.4	LICHTENBERG	74	Using HABIBI 73

$\Xi(1530)^0$ IMAGINARY PART

VALUE	*DOCUMENT ID*		*COMMENT*
4.45±0.35	LICHTENBERG	74	Using HABIBI 73

$\Xi(1530)^-$ REAL PART

VALUE	*DOCUMENT ID*		*COMMENT*
1534.4±1.1	LICHTENBERG	74	Using HABIBI 73

$\Xi(1530)^-$ IMAGINARY PART

VALUE	*DOCUMENT ID*		*COMMENT*
$3.9^{+1.75}_{-3.9}$	LICHTENBERG	74	Using HABIBI 73

$\Xi(1530)$ DECAY MODES

	Mode	Fraction (Γ_i/Γ)	Confidence level
Γ_1	$\Xi\pi$	100 %	
Γ_2	$\Xi\gamma$	<4 %	90%

$\Xi(1530)$ BRANCHING RATIOS

$\Gamma(\Xi\gamma)/\Gamma_{total}$ **Γ_2/Γ**

VALUE	*CL%*	*DOCUMENT ID*	*TECN*	*COMMENT*
<0.04	90	KALBFLEISCH 75	HBC	$K^- p$ 2.18 GeV/c

$\Xi(1530)$ FOOTNOTES

[1] BAUBILLIER 81B is a fit to the inclusive spectrum. The resolution (5 MeV) is not unfolded.
[2] Redundant with data in the mass Listings.
[3] SIXEL 79 doesn't unfold the experimental resolution of 15 MeV.

$\Xi(1530)$ REFERENCES

ASTON	85B	PR D32 2270	+Carnegie+	(SLAC, CARL, CNRC, CINC)
BAUBILLIER	81B	NP B192 1	+	(BIRM, CERN, GLAS, MSU, CURIN)
BIAGI	81	ZPHY C9 305	+	(BRIS, CAVE, GEVA, HEIDP, LAUS, LOQM, RHEL)
SIXEL	79	NP B159 125	+Bottcher+	(AACH3, BERL, CERN, LOIC, VIEN)
DEBELLEFON	75B	NC 28A 289	De Bellefon, Berthon, Billoir+	(CDEF, SACL)
KALBFLEISCH	75	PR D11 987	+Strand, Chapman	(BNL, MICH)
BERTHON	74	NC 21A 146	+Tristram+	(CDEF, RHEL, SACL, STRB)
LICHTENBERG	74	PR D10 3865		(IND)
Also	74B	Private Comm.	Lichtenberg	(IND)
HABIBI	73	Thesis Nevis 199		(COLU)
ROSS	73B	Purdue Conf. 355	+Lloyd, Radojicic	(OXF)
BADIER	72	NP B37 429	+Barrelet, Charlton, Videau	(EPOL)
BALTAY	72	PL 42B 129	+Bridgewater, Cooper, Gershwin+	(COLU, BING)
BORENSTEIN	72	PR D5 1559	+Danburg, Kalbfleisch+	(BNL, MICH) I
KIRSCH	72	NP B40 349	+Schmidt, Chang+	(BRAN, UMD, SYRA, TUFTS) I
BERGE	66	PR 147 945	+Eberhard, Hubbard, Merrill+	(LRL) I
LONDON	66	PR 143 1034	+Rau, Goldberg, Lichtman+	(BNL, SYRA) IJ
MERRILL	66	Thesis UCRL 16455		(LRL) JP
PJERROU	65B	PRL 14 275	+Schlein, Slater, Smith, Stork, Ticho	(UCLA)
SCHLEIN	63B	PRL 11 167	+Carmony, Pjerrou, Slater, Stork, Ticho	(UCLA) IJP

OTHER RELATED PAPERS

MAZZUCATO	81	NP B178 1	+Pennino+	(AMST, CERN, NIJM, OXF)
BRIEFEL	77	PR D16 2706	+Gourevitch, Chang+	(BRAN, UMD, SYRA, TUFTS)
BRIEFEL	75	PR D12 1859	+Gourevitch+	(BRAN, UMD, SYRA, TUFTS)
HUNGERBU...	74	PR D10 2051	Hungerbuhler, Majka+	(YALE, FNAL, BNL, PITT)
BUTTON-...	66	PR 142 883	Button-Shafer, Lindsey, Murray, Smith	(LRL) JP