

$\Xi(1530) P_{13}$

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

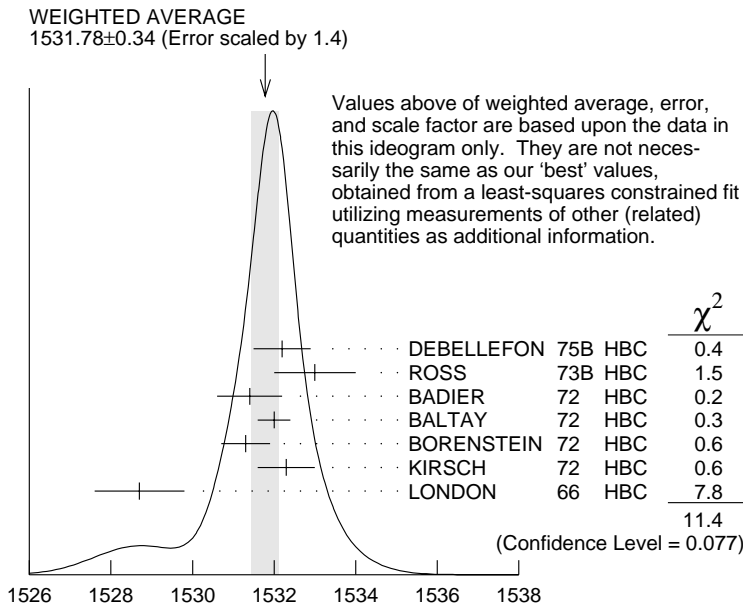
This is the only Ξ resonance whose properties are all reasonably well known. Spin-parity $3/2^+$ is favored by the data.

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

<u>VALUE (MeV)</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
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	$K^- p \rightarrow \Xi^- \bar{K} \pi$
1533 ± 1		ROSS 73B	HBC	$K^- p \rightarrow \Xi \bar{K} \pi(\pi)$
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	$K^- p \rightarrow \Xi^- \bar{K} \pi$
1535.3±2.0		ROSS	73B HBC	$K^- p \rightarrow \Xi^- \bar{K} \pi (\pi)$
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

$m_{\Xi(1530)^-} - m_{\Xi(1530)^0}$

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

<u>VALUE (MeV)</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
9.1±0.5 OUR AVERAGE				
9.5±1.2		DEBELLEFON	75B HBC	$K^- p \rightarrow \Xi^- \bar{K} \pi$
9.1±2.4		ROSS	73B HBC	$K^- p \rightarrow \Xi^- \bar{K} \pi (\pi)$
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

<u>VALUE (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
9.9^{+1.7}_{-1.9} OUR AVERAGE			
9.6±2.8	DEBELLEFON	75B HBC	$K^- p \rightarrow \Xi^- \bar{K} \pi$
8.3±3.6	ROSS	73B HBC	$K^- p \rightarrow \Xi^- \bar{K} \pi (\pi)$
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

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>COMMENT</u>
1531.6±0.4	LICHTENBERG74	Using HABIBI 73

$\Xi(1530)^0$ IMAGINARY PART

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>COMMENT</u>
4.45±0.35	LICHTENBERG74	Using HABIBI 73

$\Xi(1530)^-$ REAL PART

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>COMMENT</u>
1534.4±1.1	LICHTENBERG74	Using HABIBI 73

$\Xi(1530)^-$ IMAGINARY PART

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>COMMENT</u>
3.9 ^{+1.75} _{-3.9}	LICHTENBERG74	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

$\Gamma(\Xi\gamma)/\Gamma_{\text{total}}$	Γ_2/Γ
<u>VALUE</u>	<u>CL%</u>
<0.04	90
<u>DOCUMENT ID</u>	<u>TECN</u>
KALBFLEISCH 75	HBC
<u>COMMENT</u>	$K^- p$ 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