NODE=B049

$\Xi(1530)\ 3/2^+$

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

This is the only Ξ resonance whose properties are all reasonably well known. Assuming that the Λ_c^+ has $J^P = 1/2^+$, AUBERT 08AK, in a study of $\Lambda_c^+ \to \Xi^-\pi^+K^+$, finds conclusively that the spin of the $\Xi(1530)^0$ is 3/2. In conjunction with SCHLEIN 63B and BUTTON-SHAFER 66, this proves also that the parity is +.

NODE=B049

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

$\Xi(1530)$ POLE POSITIONS

NODE=B049220

$\Xi(1530)^0$ REAL PART

NODE=B049RE0

VALUE	DOCUMENT ID	COMMENT
1531.6±0.4	LICHTENBERG74	Using HABIBI 73

NODE=B049RE0

$\Xi(1530)^0$ IMAGINARY PART

NODE=B049IM0

VALUE	DOCUMENT ID	COMMENT
4.45±0.35	LICHTENBERG74	Using HABIBI 73

NODE=B049IM0

$\Xi(1530)^-$ REAL PART

NODE=B049RE-

VALUE	DOCUMENT ID	COMMENT
1534.4±1.1	LICHTENBERG74	Using HABIBI 73

NODE=B049RE-

$\Xi(1530)^-$ IMAGINARY PART

NODE=B049IM-

VALUE	DOCUMENT ID	COMMENT
$3.9^{+1.75}_{-3.9}$	LICHTENBERG74	Using HABIBI 73

NODE=B049IM-

$\Xi(1530)$ MASSES

NODE=B049205

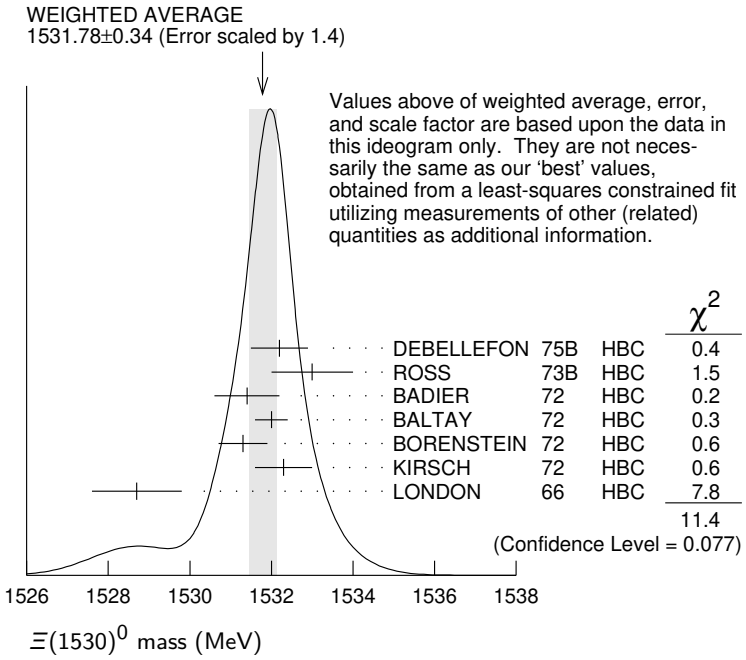
$\Xi(1530)^0$ MASS

NODE=B049M0

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	$K^-p \to \Xi^-\overline{K}\pi$
1533 ±1		ROSS	73B	HBC	$K^-p \to \Xi\overline{K}\pi(\pi)$
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

NODE=B049M0

OCCUR=2



Ξ(1530)⁻ MASS

NODE=B049M-
NODE=B049M-

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

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

NODE=B049D

NODE=B049D

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

Ξ(1530) WIDTHS

NODE=B049215

Ξ(1530)⁰ WIDTH

NODE=B049W0
NODE=B049W0

VALUE (MeV)	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
9.1±0.5 OUR AVERAGE					
9.5±1.2		DEBELLEFON	75B	HBC	$K^- p \rightarrow \Xi^- \overline{K}\pi$
9.1±2.4		ROSS	73B	HBC	$K^- p \rightarrow \Xi \overline{K}\pi(\pi)$
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 OCCUR=2

$\Xi(1530)^-$ WIDTH

NODE=B049W-
NODE=B049W-

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	$\Xi^- \pi^0$, $\Xi^0 \pi^-$

$\Xi(1530)$ DECAY MODES

NODE=B049225;NODE=B049

	Mode	Fraction (Γ_i/Γ)	Confidence level	
Γ_1	$\Xi\pi$	100 %		DESIG=1;OUR EST
Γ_2	$\Xi\gamma$	<3.7 %	90%	DESIG=2

$\Xi(1530)$ BRANCHING RATIOS

NODE=B049230

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

NODE=B049R1
NODE=B049R1

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.037	90	ABLIKIM	20	BES3	$J/\psi \to \Xi(1530)^- \overline{\Xi}^+$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.04	90	KALBFLEISCH	75	HBC	$K^- p$ 2.18 GeV/c

$\Xi(1530)$ FOOTNOTES

NODE=B049

[1] BAUBILLIER 81B is a fit to the inclusive spectrum. The resolution (5 MeV) is not unfolded.
NODE=B049;LINKAGE=A

[2] Redundant with data in the mass Listings.
NODE=B049;LINKAGE=B

[3] SIXEL 79 doesn't unfold the experimental resolution of 15 MeV.
NODE=B049;LINKAGE=C

$\Xi(1530)$ REFERENCES

NODE=B049

ABLIKIM	20	PR D101 012004	M. Ablikim *et al.*	(BESIII Collab.)	REFID=60048
AUBERT	08AK	PR D78 034008	B. Aubert *et al.*	(BABAR Collab.)	REFID=52360
ASTON	85B	PR D32 2270	D. Aston *et al.*	(SLAC, CARL, CNRC, CINC)	REFID=12073
BAUBILLIER	81B	NP B192 1	M. Baubillier *et al.*	(BIRM, CERN, GLAS+)	REFID=32486
BIAGI	81	ZPHY C9 305	S.F. Biagi *et al.*	(BRIS, CAVE, GEVA+)	REFID=32065
SIXEL	79	NP B159 125	P. Sixel *et al.*	(AACH3, BERL, CERN, LOIC+)	REFID=32485
DEBELLEFON	75B	NC 28A 289	A. de Bellefon *et al.*	(CDEF, SACL)	REFID=32003
KALBFLEISCH	75	PR D11 987	G.R. Kalbfleisch, R.C. Strand, J.W. Chapman	(BNL+)	REFID=20223
BERTHON	74	NC 21A 146	A. Berthon *et al.*	(CDEF, RHEL, SACL+)	REFID=31745
LICHTENBERG	74	PR D10 3865	D.B. Lichtenberg	(IND)	REFID=32042
Also		Private Comm.	D.B. Lichtenberg	(IND)	REFID=32043
HABIBI	73	Thesis Nevis 199	M. Habibi	(COLU)	REFID=32476
ROSS	73B	Purdue Conf. 355	R.T. Ross, J.L. Lloyd, D. Radojicic	(OXF)	REFID=32479
BADIER	72	NP B37 429	J. Badier *et al.*	(EPOL)	REFID=32474
BALTAY	72	PL 42B 129	C. Baltay *et al.*	(COLU, BING)	REFID=32475
BORENSTEIN	72	PR D5 1559	S.R. Borenstein *et al.*	(BNL, MICH) I	REFID=20215
KIRSCH	72	NP B40 349	L.E. Kirsch *et al.*	(BRAN, UMD, SYRA+) I	REFID=32478
BERGE	66	PR 147 945	J.P. Berge *et al.*	(LRL) I	REFID=12011
BUTTON-...	66	PR 142 883	J. Button-Shafer *et al.*	(LRL) JP	REFID=32489
LONDON	66	PR 143 1034	G.W. London *et al.*	(BNL, SYRA) IJ	REFID=11774
MERRILL	66	Thesis UCRL 16455	D.W. Merrill	(LRL) JP	REFID=32473
PJERROU	65B	PRL 14 275	G.M. Pjerrou *et al.*	(UCLA)	REFID=12009
SCHLEIN	63B	PRL 11 167	P.E. Schlein *et al.*	(UCLA) IJP	REFID=32468

OTHER RELATED PAPERS

MAZZUCATO	81	NP B178 1	M. Mazzucato *et al.*	(AMST, CERN, NIJM+)	REFID=32493
BRIEFEL	77	PR D16 2706	E. Briefel *et al.*	(BRAN, UMD, SYRA+)	REFID=32345
BRIEFEL	75	PR D12 1859	E. Briefel *et al.*	(BRAN, UMD, SYRA+)	REFID=32464
HUNGERBU...	74	PR D10 2051	V. Hungerbuhler *et al.*	(YALE, FNAL, BNL+)	REFID=32061
BUTTON-...	66	PR 142 883	J. Button-Shafer *et al.*	(LRL) JP	REFID=32489