Ξ_b^0, Ξ_b^-

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

OMITTED FROM SUMMARY TABLE

ABREU 95V observe an excess of same-sign $\Xi^\mp \ell^\mp$ events in jets, which they interpret as $\Xi_b \to \Xi^- \ell^- \overline{\nu}_\ell$ X. They find that the probability for these events to come from non-b-baryon decays is less than 5×10^{-4} and that Λ_b decays can account for less than 10% of these events.

In the quark model, Ξ_b^0 and Ξ_b^- are an isodoublet ($u\,s\,b$, $d\,s\,b$) state; the lowest Ξ_b^0 and Ξ_b^- ought to have $J^P = 1/2^+$. None of I, J, or P have actually been measured.

Ξ_b MEAN LIFE

This is actually a measurement of the average lifetime of b-baryons that decay to a jet containing a same-sign $\Xi^\mp \ell^\mp$ pair. Presumably the mix is mainly Ξ_b, with some Λ_b.

"OUR EVALUATION" is an average using rescaled values of the data listed below. The average and rescaling were performed by the Heavy Flavor Averaging Group (HFAG) and are described at http://www.slac.stanford.edu/xorg/hfag/. The averaging/rescaling procedure takes into account corrections between the measurements and asymmetric lifetime errors.

VALUE (10^{-12} s)	EVTS	DOCUMENT ID		TECN	COMMENT
$1.39^{+0.34}_{-0.28}$ OUR EVALUATION					
$1.35^{+0.37}_{-0.28}{}^{+0.15}_{-0.17}$		[1] BUSKULIC	96T	ALEP	$e^+e^- \to Z$
$1.5\ ^{+0.7}_{-0.4}\ \pm 0.3$	8	[2] ABREU	95V	DLPH	$e^+e^- \to Z$

[1] Excess $\Xi^- \ell^-$, impact parameters.
[2] Excess $\Xi^- \ell^-$, decay lengths.

Ξ_b DECAY MODES

	Mode	Fraction (Γ_i/Γ)
Γ_1	$\Xi^- \ell^- \overline{\nu}_\ell$ anything	seen

Ξ_b BRANCHING RATIOS

$\Gamma(\Xi^- \ell^- \overline{\nu}_\ell \text{ anything})/\Gamma_{\text{total}}$ Γ_1/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
seen	[3] BUSKULIC	96T	ALEP	Excess $\Xi^- \ell^-$ over $\Xi^- \ell^+$
seen	ABREU	95V	DLPH	Excess $\Xi^- \ell^-$ over $\Xi^- \ell^+$

[3] BUSKULIC 96T measures $[B(b \to \Xi_b) \times B(\Xi_b \to \Xi^- \ell^- \overline{\nu}_\ell \text{ anything})] = (5.4 \pm 1.1 \pm 0.8) \times 10^{-4}$ per lepton species, averaged over e and μ.

Ξ_b REFERENCES

BUSKULIC	96T	PL B384 449	D. Buskulic *et al.*	(ALEPH Collab.)
ABREU	95V	ZPHY C68 541	P. Abreu *et al.*	(DELPHI Collab.)