# $\Xi_b^0$, $\Xi_b^-$

$I(J^P) = 0(\frac{1}{2}^+)$ 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 $5 \times 10^{-4}$ and that $\Lambda_b$ decays can account for less than 10% of these events.

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

## $\Xi_b$ 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 $\Xi_b$, with some $\Lambda_b$.

"OUR EVALUATION" is an average of the data listed below performed by the LEP $B$ Lifetimes Working Group as described in our review "Production and Decay of $b$-flavored Hadrons" in the $B^\pm$ Section of the Listings. The averaging procedure takes into account correlations between the measurements and asymmetric lifetime errors.

| *VALUE* ($10^{-12}$ s) | *EVTS* | *DOCUMENT ID* | *TECN* | *COMMENT* |
|---|---|---|---|---|
| **$1.39^{+0.34}_{-0.28}$ OUR EVALUATION** | | | | |
| $1.35^{+0.37}_{-0.28}{}^{+0.15}_{-0.17}$ | | BUSKULIC | 96T ALEP | Excess $\Xi^- \ell^-$, impact parameters |
| $1.5\ ^{+0.7}_{-0.4}\ \pm 0.3$ | 8 | ABREU | 95V DLPH | Excess $\Xi^- \ell^-$, decay lengths |

## $\Xi_b$ DECAY MODES

| | Mode | Fraction ($\Gamma_i/\Gamma$) |
|---|---|---|
| $\Gamma_1$ | $\Xi^- \ell^- \overline{\nu}_\ell$ anything | seen |

## $\Xi_b$ BRANCHING RATIOS

### $\Gamma(\Xi^- \ell^- \overline{\nu}_\ell \text{ anything})/\Gamma_{\text{total}}$ $\Gamma_1/\Gamma$

| *VALUE* | *DOCUMENT ID* | | *TECN* | *COMMENT* |
|---|---|---|---|---|
| seen | [1] BUSKULIC | 96T | ALEP | Excess $\Xi^- \ell^-$ over $\Xi^- \ell^+$ |
| **seen** | ABREU | 95V | DLPH | Excess $\Xi^- \ell^-$ over $\Xi^- \ell^+$ |

[1] 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 $\mu$.

## $\Xi_b$ REFERENCES


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