



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

$I, J, P$  need confirmation.

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.

## $\Xi_b$ MASSES

### $\Xi_b^-$ MASS

VALUE (MeV)	DOCUMENT ID	TECN	COMMENT
<b>5792.4 ± 3.0 OUR AVERAGE</b>			
5792.9 ± 2.5 ± 1.7	<sup>1</sup> AALTONEN 07A	CDF	$p\bar{p}$ at 1.96 TeV
5774 ± 11 ± 15	<sup>2</sup> ABAZOV 07K	D0	$p\bar{p}$ at 1.96 TeV

<sup>1</sup> Observed in  $\Xi_b^- \rightarrow J/\psi \Xi^-$  decays with  $17.5 \pm 4.3$  candidates, a significance of 7.7 sigma.

<sup>2</sup> Observed in  $\Xi_b^- \rightarrow J/\psi \Xi^-$  decays with  $15.2 \pm 4.4^{+1.9}_{-0.4}$  candidates, a significance of 5.5 sigma.

## $\Xi_b$ 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 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 correlations between the measurements and asymmetric lifetime errors.

VALUE ( $10^{-12}$ s)	EVTS	DOCUMENT ID	TECN	COMMENT
<b>1.42<sup>+0.28</sup><sub>-0.24</sub> OUR EVALUATION</b>				

1.48<sup>+0.40</sup><sub>-0.31</sub> ± 0.12      <sup>3</sup> ABDALLAH 05C DLPH  $e^+ e^- \rightarrow Z^0$

1.35<sup>+0.37+0.15</sup><sub>-0.28-0.17</sub>      <sup>4</sup> BUSKULIC 96T ALEP  $e^+ e^- \rightarrow Z$

• • • We do not use the following data for averages, fits, limits, etc. • • •

1.5<sup>+0.7</sup><sub>-0.4</sub> ± 0.3      8      <sup>5</sup> ABREU 95V DLPH Repl. by ABDALLAH 05C

<sup>3</sup> Used the decay length of  $\Xi^-$  accompanied by a lepton of the same sign.

<sup>4</sup> Excess  $\Xi^- \ell^-$ , impact parameters.

<sup>5</sup> Excess  $\Xi^- \ell^-$ , decay lengths.

## $\Xi_b$ DECAY MODES

Mode	Fraction ( $\Gamma_i/\Gamma$ )	Scale factor
$\Gamma_1$ $\Xi_b^- \rightarrow \Xi^- \ell^- \bar{\nu}_\ell X \times B(\bar{b} \rightarrow \Xi_b^-)$	$(3.9 \pm 1.2) \times 10^{-4}$	1.4
$\Gamma_2$ $\Xi_b^- \rightarrow J/\psi \Xi^- \times B(b \rightarrow \Xi_b^-)$	$(1.3 \pm 0.9) \times 10^{-5}$	

## $\Xi_b$ BRANCHING RATIOS

$\Gamma(\Xi^- \ell^- \bar{\nu}_\ell \times B(\bar{b} \rightarrow \Xi_b^-))/\Gamma_{\text{total}}$   $\Gamma_1/\Gamma$

VALUE (units $10^{-4}$ )	DOCUMENT ID	TECN	COMMENT
<b><math>3.9 \pm 1.2</math> OUR AVERAGE</b>	Error includes scale factor of 1.4.		
$3.0 \pm 1.0 \pm 0.3$	ABDALLAH	05C	DLPH $e^+e^- \rightarrow Z^0$
$5.4 \pm 1.1 \pm 0.8$	BUSKULIC	96T	ALEP Excess $\Xi^- \ell^-$ over $\Xi^- \ell^+$
• • • We do not use the following data for averages, fits, limits, etc. • • •			
$5.9 \pm 2.1 \pm 1.0$	ABREU	95V	DLPH Repl. by ABDALLAH 05C

$\Gamma(J/\psi \Xi^- \times B(b \rightarrow \Xi_b^-))/\Gamma_{\text{total}}$   $\Gamma_2/\Gamma$

VALUE (units $10^{-4}$ )	DOCUMENT ID	TECN	COMMENT
<b><math>0.13 \pm 0.06 \pm 0.06</math></b>	<sup>6</sup> ABAZOV	07K	D0 $p\bar{p}$ at 1.96 TeV

<sup>6</sup> ABAZOV 07K reports  $[\Gamma(\Xi_b^- \rightarrow J/\psi \Xi^- \times B(b \rightarrow \Xi_b^-))/\Gamma_{\text{total}}] / [B(\Lambda_b^0 \rightarrow J/\psi(1S)\Lambda \times B(b \rightarrow \Lambda_b^0))] = 0.28 \pm 0.09^{+0.09}_{-0.08}$ . We multiply by our best value  $B(\Lambda_b^0 \rightarrow J/\psi(1S)\Lambda \times B(b \rightarrow \Lambda_b^0)) = (4.7 \pm 2.3) \times 10^{-5}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value.

## $\Xi_b$ REFERENCES

AALTONEN	07A	PRL 99 052002	T. Aaltonen <i>et al.</i>	(CDF Colab.)
ABAZOV	07K	PRL 99 052001	V.M. Abazov <i>et al.</i>	(D0 Colab.)
ABDALLAH	05C	EPJ C44 299	J. Abdallah <i>et al.</i>	(DELPHI Collab.)
BUSKULIC	96T	PL B384 449	D. Buskulic <i>et al.</i>	(ALEPH Collab.)
ABREU	95V	ZPHY C68 541	P. Abreu <i>et al.</i>	(DELPHI Collab.)