Ξ_b^0, Ξ_b^-

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

In the quark model, Ξ_b^0 and Ξ_b^- are an isodoublet (usb, dsb) 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 MASSES

Ξ_b^- MASS

VALUE (MeV)	DOCUMENT ID		TECN	COMMENT
5791.1± 2.2 OUR AVERAGE	Includes data from the datablock that follows this one.			
5796.7± 5.1± 1.4	[1] AALTONEN	11X	CDF	$p\overline{p}$ at 1.96 TeV
5790.9± 2.6± 0.8	[2] AALTONEN	09AP	CDF	$p\overline{p}$ at 1.96 TeV
5774 ±11 ±15	[3] ABAZOV	07K	D0	$p\overline{p}$ at 1.96 TeV
• • • We do not use the following data for averages, fits, limits, etc. • • •				
5792.9± 2.5± 1.7	[4] AALTONEN	07A	CDF	Repl. by AALTONEN 09AP

[1] Measured in $\Xi_b^- \to \Xi_c^0 \pi^-$ with $25.8^{+5.5}_{-5.2}$ candidates.

[2] Measured in $\Xi_b^- \to J/\psi \Xi^-$ decays with 66^{+14}_{-9} candidates.

[3] Observed in $\Xi_b^- \to J/\psi \Xi^-$ decays with $15.2 \pm 4.4^{+1.9}_{-0.4}$ candidates, a significance of 5.5 sigma.

[4] Observed in $\Xi_b^- \to J/\psi \Xi^-$ decays with 17.5 ± 4.3 candidates, a significance of 7.7 sigma.

Ξ_b^0 MASS

VALUE (MeV)	DOCUMENT ID		TECN	COMMENT
The data in this block is included in the average printed for a previous datablock.				
5787.8±5.0±1.3	[5] AALTONEN	11X	CDF	$p\overline{p}$ at 1.96 TeV

[5] Measured in $\Xi_b^0 \to \Xi_c^+ \pi^-$ with $25.3^{+5.6}_{-5.4}$ candidates.

$m_{\Xi_b^-} - m_{\Xi_b^0}$

VALUE (MeV)	DOCUMENT ID		TECN	COMMENT
3.1±5.6±1.3	[6] AALTONEN	11X	CDF	$p\overline{p}$ at 1.96 TeV

[6] Derived from measurements in $\Xi_b^0 \to \Xi_c^+ \pi^-$ and $\Xi_b^- \to J/\psi \Xi^-$ from AALTONEN 09AP taking correlated systematic uncertainties into account.

Ξ_b^- MEAN LIFE

VALUE (10^{-12} s)	DOCUMENT ID		TECN	COMMENT
$\mathbf{1.56^{+0.27}_{-0.25} \pm 0.02}$	[7] AALTONEN	09AP	CDF	$p\overline{p}$ at 1.96 TeV

[7] Measured in $\Xi_b^- \to J/\psi \Xi^-$ decays with 66^{+14}_{-9} candidates.

Ξ_b MEAN LIFE

"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*
$1.49^{+0.19}_{-0.18}$ OUR EVALUATION					
$1.56^{+0.27}_{-0.25}\pm0.02$		[8] AALTONEN	09AP	CDF	$p\overline{p}$ at 1.96 TeV
$1.48^{+0.40}_{-0.31}\pm0.12$		[9] ABDALLAH	05C	DLPH	$e^+e^-\to Z^0$
$1.35^{+0.37}_{-0.28}{}^{+0.15}_{-0.17}$		[10] BUSKULIC	96T	ALEP	$e^+e^-\to Z$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$1.5\ ^{+0.7}_{-0.4}\ \pm0.3$	8	[11] ABREU	95V	DLPH	Repl. by ABDALLAH 05C

[8] Measured in $\Xi_b^-\to J/\psi\Xi^-$ decays with 66^{+14}_{-9} candidates.
[9] Used the decay length of Ξ^- accompanied by a lepton of the same sign.
[10] Excess $\Xi^-\ell^-$, impact parameters.
[11] Excess $\Xi^-\ell^-$, decay lengths.

Ξ_b DECAY MODES

	Mode	Fraction (Γ_i/Γ)	Scale factor
Γ_1	$\Xi_b\to\ \Xi^-\ell^-\overline{\nu}_\ell X\times$B($\overline{b}\to\ \Xi_b$)	$(3.9\ \pm1.2\ )\times10^{-4}$	1.4
Γ_2	$\Xi_b^-\to\ J/\psi\Xi^-\times$ B($b\to\ \Xi_b^-$)	$(1.02^{+0.26}_{-0.21})\times10^{-5}$	

Ξ_b BRANCHING RATIOS

$\Gamma(\Xi^-\ell^-\overline{\nu}_\ell X\times$B($\overline{b}\to\ \Xi_b$)$)/\Gamma_{\rm total}$ Γ_1/Γ

VALUE (units 10^{-4})	*DOCUMENT ID*		*TECN*	*COMMENT*
3.9±1.2 OUR AVERAGE	Error includes scale factor of 1.4.			
3.0±1.0±0.3	ABDALLAH	05C	DLPH	$e^+e^-\to Z^0$
5.4±1.1±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±2.1±1.0	ABREU	95V	DLPH	Repl. by ABDALLAH 05C

$\Gamma(J/\psi\Xi^-\times$B($b\to\ \Xi_b^-$)$)/\Gamma_{\rm total}$ Γ_2/Γ

VALUE (units 10^{-4})	*DOCUMENT ID*		*TECN*	*COMMENT*
$0.102^{+0.026}_{-0.021}$ OUR AVERAGE				
$0.098^{+0.023}_{-0.016}\pm0.014$	[12] AALTONEN	09AP	CDF	$p\overline{p}$ at 1.96 TeV
0.16 ±0.07 ±0.02	[13] ABAZOV	07K	D0	$p\overline{p}$ at 1.96 TeV

[12] AALTONEN 09AP reports $[\Gamma(\Xi_b^- \rightarrow J/\psi\Xi^- \times \mathrm{B}(b \rightarrow \Xi_b^-))/\Gamma_{\mathrm{total}}]$ / $[\mathrm{B}(\Lambda_b^0 \rightarrow J/\psi(1S)\Lambda \times \mathrm{B}(b \rightarrow \Lambda_b^0))] = 0.167^{+0.037}_{-0.025} \pm 0.012$ which we multiply by our best value $\mathrm{B}(\Lambda_b^0 \rightarrow J/\psi(1S)\Lambda \times \mathrm{B}(b \rightarrow \Lambda_b^0)) = (5.8 \pm 0.8) \times 10^{-5}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

[13] ABAZOV 07K reports $[\Gamma(\Xi_b^- \rightarrow J/\psi\Xi^- \times \mathrm{B}(b \rightarrow \Xi_b^-))/\Gamma_{\mathrm{total}}]$ / $[\mathrm{B}(\Lambda_b^0 \rightarrow J/\psi(1S)\Lambda \times \mathrm{B}(b \rightarrow \Lambda_b^0))] = 0.28 \pm 0.09^{+0.09}_{-0.08}$ which we multiply by our best value $\mathrm{B}(\Lambda_b^0 \rightarrow J/\psi(1S)\Lambda \times \mathrm{B}(b \rightarrow \Lambda_b^0)) = (5.8 \pm 0.8) \times 10^{-5}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

Ξ_b REFERENCES

AALTONEN	11X	PRL 107 102001	T. Aaltonen *et al.*	(CDF Collab.)
AALTONEN	09AP	PR D80 072003	T. Aaltonen *et al.*	(CDF Collab.)
AALTONEN	07A	PRL 99 052002	T. Aaltonen *et al.*	(CDF Colab.)
ABAZOV	07K	PRL 99 052001	V.M. Abazov *et al.*	(D0 Colab.)
ABDALLAH	05C	EPJ C44 299	J. Abdallah *et al.*	(DELPHI Collab.)
BUSKULIC	96T	PL B384 449	D. Buskulic *et al.*	(ALEPH Collab.)
ABREU	95V	ZPHY C68 541	P. Abreu *et al.*	(DELPHI Collab.)