BOTTOM BARYONS ($B = -1$)

$\Lambda_b^0 = udb$, $\Xi_b^0 = usb$, $\Xi_b^- = dsb$, $\Omega_b^- = ssb$

Λ_b^0

$I(J^P) = 0(\frac{1}{2}^+)$

$I(J^P)$ not yet measured; $0(\frac{1}{2}^+)$ is the quark model prediction.

Mass $m = 5620.2 \pm 1.6$ MeV

$m_{\Lambda_b} - m_{B^0} = 339.2 \pm 1.4$ MeV

Mean life $\tau = (1.391^{+0.038}_{-0.037}) \times 10^{-12}$ s

$c\tau = 417$ μm

The branching fractions B(b-baryon $\rightarrow$ $\Lambda\ell^-\overline{\nu}_\ell$ anything) and B($\Lambda_b^0 \rightarrow$ $\Lambda_c^+\ell^-\overline{\nu}_\ell$ anything) are not pure measurements because the underlying measured products of these with B($b \rightarrow$ b-baryon) were used to determine B($b \rightarrow$ b-baryon), as described in the note "Production and Decay of b-Flavored Hadrons."

For inclusive branching fractions, *e.g.*, $\Lambda_b \rightarrow$ $\overline{\Lambda}_c$ anything, the values usually are multiplicities, not branching fractions. They can be greater than one.

Λ_b^0 DECAY MODES		Fraction (Γ_i/Γ)	Confidence level	p (MeV/c)
$J/\psi(1S)\Lambda \times$ B($b \rightarrow$ Λ_b^0)		$(4.7 \pm 2.3) \times 10^{-5}$		1741
$\Lambda_c^+\pi^-$		$(8.8 \pm 3.2) \times 10^{-3}$		2343
$\Lambda_c^+ a_1(1260)^-$		seen		2153
$\Lambda_c^+\ell^-\overline{\nu}_\ell$ anything	[a]	(10.7 ± 3.2) %		–
$\Lambda_c^+\ell^-\overline{\nu}_\ell$		$(5.0^{+1.9}_{-1.4})$ %		2345
$\Lambda_c^+\pi^+\pi^-\ell^-\overline{\nu}_\ell$		(5.6 ± 3.1) %		2335
$\Lambda_c(2595)^+\ell^-\overline{\nu}_\ell$		$(6.3^{+4.0}_{-3.1}) \times 10^{-3}$		2211
$\Lambda_c(2625)^+\ell^-\overline{\nu}_\ell$		$(1.1^{+0.6}_{-0.4})$ %		2196
ph^-	[b]	$< 2.3 \times 10^{-5}$	90%	2730
$p\pi^-$		$(3.8 \pm 1.3) \times 10^{-6}$		2730
pK^-		$(6.0 \pm 1.9) \times 10^{-6}$		2709
$\Lambda\gamma$		$< 1.3 \times 10^{-3}$	90%	2699

Σ_b

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

Mass $m(\Sigma_b^+) = 5807.8 \pm 2.7$ MeV
Mass $m(\Sigma_b^-) = 5815.2 \pm 2.0$ MeV

Σ_b DECAY MODES	Fraction (Γ_i/Γ)	p (MeV/c)
$\Lambda_b^0\pi$	dominant	128

Σ_b^*

$I(J^P) = 1(\frac{3}{2}^+)$
I, J, P need confirmation.

Mass $m(\Sigma_b^{*+}) = 5829.0 \pm 3.4$ MeV
Mass $m(\Sigma_b^{*-}) = 5836.4 \pm 2.8$ MeV
$m_{\Sigma_b^*} - m_{\Sigma_b} = 21.2 \pm 2.0$ MeV

Σ_b^* DECAY MODES	Fraction (Γ_i/Γ)	p (MeV/c)
$\Lambda_b^0\pi$	dominant	156

Ξ_b^0, Ξ_b^-

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

Mass $m = 5790.5 \pm 2.7$ MeV
Mean life $\tau_{\Xi_b^-} = (1.56 \pm 0.26) \times 10^{-12}$ s
Mean life $\tau_{\Xi_b} = (1.49^{+0.19}_{-0.18}) \times 10^{-12}$ s

Ξ_b DECAY MODES	Fraction (Γ_i/Γ)	Scale factor	p (MeV/c)
$\Xi_b \to \Xi^-\ell^-\overline{\nu}_\ell X \times$B($\overline{b} \to \Xi_b$)	$(3.9 \pm 1.2) \times 10^{-4}$	1.4	–
$\Xi_b^- \to J/\psi\Xi^- \times$ B($b \to \Xi_b^-$)	$(8 \pm 4) \times 10^{-6}$		–

Ω_b^-

$I(J^P) = 0(\frac{1}{2}^+)$
I, J, P need confirmation.

Mass $m = 6071 \pm 40$ MeV (S = 6.2)
Mean life $\tau = (1.1^{+0.5}_{-0.4}) \times 10^{-12}$ s

Ω_b^- **DECAY MODES**	Fraction (Γ_i/Γ)	p (MeV/c)
$J/\psi\,\Omega^- \times$B($b \rightarrow\ \Omega_b$)	$(2.4\pm1.2)\times10^{-6}$	1826

b-baryon ADMIXTURE (Λ_b, Ξ_b, Σ_b, Ω_b)

Mean life $\tau = (1.345 \pm 0.032)\times10^{-12}$ s

These branching fractions are actually an average over weakly decaying b-baryons weighted by their production rates in Z decay (or high-energy $p\overline{p}$), branching ratios, and detection efficiencies. They scale with the LEP b-baryon production fraction B($b \rightarrow\ b$-baryon) and are evaluated for our value B($b \rightarrow\ b$-baryon) = (9.2 ± 1.8)%.

The branching fractions B(b-baryon $\rightarrow\ \Lambda\ell^-\overline{\nu}_\ell$anything) and B($\Lambda_b^0 \rightarrow \Lambda_c^+\ell^-\overline{\nu}_\ell$anything) are not pure measurements because the underlying measured products of these with B($b \rightarrow\ b$-baryon) were used to determine B($b \rightarrow\ b$-baryon), as described in the note "Production and Decay of b-Flavored Hadrons."

For inclusive branching fractions, *e.g.*, $B \rightarrow\ D^\pm$anything, the values usually are multiplicities, not branching fractions. They can be greater than one.

***b*-baryon ADMIXTURE DECAY MODES** (Λ_b,Ξ_b,Σ_b,Ω_b)	Fraction (Γ_i/Γ)	p (MeV/c)
$p\mu^-\overline{\nu}$anything	($5.8^{+\ 2.6}_{-\ 2.4}$) %	–
$p\ell\overline{\nu}_\ell$anything	(5.6± 1.7) %	–
$p$anything	(69 ±27) %	–
$\Lambda\ell^-\overline{\nu}_\ell$anything	(3.7± 1.0) %	–
$\Lambda/\overline{\Lambda}$anything	(39 ±11) %	–
$\Xi^-\ell^-\overline{\nu}_\ell$anything	(6.5± 2.2) $\times10^{-3}$	–

NOTES

[*a*] Not a pure measurement. See note at head of Λ_b^0 Decay Modes.

[*b*] Here h^- means π^- or K^-.