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 $m = 5619.4 \pm 0.7$ MeV
$m_{\Lambda_b^0} - m_{B^0} = 339.2 \pm 1.4$ MeV
$m_{\Lambda_b^0} - m_{B^+} = 339.7 \pm 0.7$ MeV
Mean life $\tau = (1.425 \pm 0.032) \times 10^{-12}$ s
$c\tau = 427$ μm
$A_{CP}(\Lambda_b \to p\pi^-) = 0.03 \pm 0.18$
$A_{CP}(\Lambda_b \to pK^-) = 0.37 \pm 0.17$

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

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

Λ_b^0 DECAY MODES	Fraction (Γ_i/Γ)	Scale factor/ Confidence level	p (MeV/c)
$J/\psi(1S)\Lambda \times$ B($b \to \Lambda_b^0$)	$(5.8 \pm 0.8) \times 10^{-5}$		1740
$\Lambda_c^+\pi^-$	$(5.7^{+4.0}_{-2.6}) \times 10^{-3}$	S=1.6	2342
$\Lambda_c^+ a_1(1260)^-$	seen		2152
$\Lambda_c^+\pi^+\pi^-\pi^-$	$(8\ ^{+5}_{-4}) \times 10^{-3}$	S=1.6	2323
$\Lambda_c(2595)^+\pi^-$, $\Lambda_c(2595)^+ \to \Lambda_c^+\pi^+\pi^-$	$(3.7^{+2.8}_{-2.3}) \times 10^{-4}$		2210
$\Lambda_c(2625)^+\pi^-$, $\Lambda_c(2625)^+ \to \Lambda_c^+\pi^+\pi^-$	$(3.6^{+2.7}_{-2.1}) \times 10^{-4}$		2193
$\Sigma_c(2455)^0\pi^+\pi^-$, $\Sigma_c^0 \to \Lambda_c^+\pi^-$	$(6\ ^{+5}_{-4}) \times 10^{-4}$		2265

$\Sigma_c(2455)^{++}\pi^-\pi^-$, $\Sigma_c^{++} \to \Lambda_c^+\pi^+$		$(3.5^{+2.8}_{-2.3}) \times 10^{-4}$		2265
$\Lambda_c^+\ell^-\overline{\nu}_\ell$ anything	[a]	(9.8±2.3) %		–
$\Lambda_c^+\ell^-\overline{\nu}_\ell$		$(6.5^{+3.2}_{-2.5})$ %	S=1.8	2345
$\Lambda_c^+\pi^+\pi^-\ell^-\overline{\nu}_\ell$		(5.6±3.1) %		2335
$\Lambda_c(2595)^+\ell^-\overline{\nu}_\ell$		$(8 \pm 5) \times 10^{-3}$		2212
$\Lambda_c(2625)^+\ell^-\overline{\nu}_\ell$		$(1.4^{+0.9}_{-0.7})$ %		2195
ph^-	[b]	$< 2.3 \times 10^{-5}$	CL=90%	2730
$p\pi^-$		$(3.5\pm1.0) \times 10^{-6}$		2730
pK^-		$(5.5\pm1.4) \times 10^{-6}$		2708
$\Lambda\mu^+\mu^-$		$(1.7\pm0.7) \times 10^{-6}$		2695
$\Lambda\gamma$		$< 1.3 \times 10^{-3}$	CL=90%	2699

Σ_b

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

Mass $m(\Sigma_b^+) = 5811.3 \pm 1.9$ MeV
Mass $m(\Sigma_b^-) = 5815.5 \pm 1.8$ MeV
$m_{\Sigma_b^+} - m_{\Sigma_b^-} = -4.2 \pm 1.1$ MeV
$\Gamma(\Sigma_b^+) = 9.7^{+4.0}_{-3.0}$ MeV
$\Gamma(\Sigma_b^-) = 4.9^{+3.3}_{-2.4}$ MeV

Σ_b DECAY MODES	Fraction (Γ_i/Γ)	p (MeV/c)
$\Lambda_b^0\pi$	dominant	134

Σ_b^*

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

Mass $m(\Sigma_b^{*+}) = 5832.1 \pm 1.9$ MeV
Mass $m(\Sigma_b^{*-}) = 5835.1 \pm 1.9$ MeV
$m_{\Sigma_b^{*+}} - m_{\Sigma_b^{*-}} = -3.0^{+1.0}_{-0.9}$ MeV
$\Gamma(\Sigma_b^{*+}) = 11.5 \pm 2.8$ MeV
$\Gamma(\Sigma_b^{*-}) = 7.5 \pm 2.3$ 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	161

Ξ_b^0, Ξ_b^-

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

$m(\Xi_b^-) = 5791.1 \pm 2.2$ MeV
$m(\Xi_b^0) = 5788 \pm 5$ MeV
$m_{\Xi_b^-} - m_{\Xi_b^0} = 3 \pm 6$ 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)
$\Xi_b \to\ \Xi^-\ell^-\overline{\nu}_\ell X \times \mathrm{B}(\overline{b} \to\ \Xi_b)$	$(3.9\ \pm 1.2\ ) \times 10^{-4}$	1.4	–
$\Xi_b^- \to\ J/\psi\Xi^- \times \mathrm{B}(b \to\ \Xi_b^-)$	$(1.02^{+0.26}_{-0.21}) \times 10^{-5}$		–

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)
$J/\psi\,\Omega^- \times \mathrm{B}(b \to\ \Omega_b)$	$(2.9^{+1.1}_{-0.8}) \times 10^{-6}$	1826

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

Mean life $\tau = (1.382 \pm 0.029) \times 10^{-12}$ s

These branching fractions are actually an average over weakly decaying *b*-baryons weighted by their production rates at the LHC, LEP, and Tevatron, branching ratios, and detection efficiencies. They scale with the *b*-baryon production fraction B($b \rightarrow$ *b*-baryon).

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	($5.3^{+\ 2.2}_{-\ 1.9}$) %	–
$p\ell\overline{\nu}_\ell$ anything	(5.1± 1.2) %	–
p anything	(63 ±21) %	–
$\Lambda\ell^-\overline{\nu}_\ell$ anything	(3.4± 0.6) %	–
$\Lambda/\overline{\Lambda}$ anything	(35 ± 8) %	–
$\Xi^-\ell^-\overline{\nu}_\ell$ anything	(5.9± 1.6) $\times 10^{-3}$	–

NOTES

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

[*b*] Here h^- means π^- or K^-.