b-baryon ADMIXTURE (Λ_b, Ξ_b, Ω_b)

NODE=S061

b-baryon ADMIXTURE MEAN LIFE

NODE=S061T

Each measurement of the b-baryon mean life is an average over an admixture of various b baryons which decay weakly. Different techniques emphasize different admixtures of produced particles, which could result in a different b-baryon mean life. More b-baryon flavor specific channels are not included in the measurement.

NODE=S061T

NODE=S061T

VALUE (10^{-12} s)	EVTS	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$1.218^{+0.130}_{-0.115} \pm 0.042$		[1] ABAZOV 07S	D0	Repl. by ABAZOV 12U
$1.22^{+0.22}_{-0.18} \pm 0.04$		[1] ABAZOV 05C	D0	Repl. by ABAZOV 07S
$1.16 \pm 0.20 \pm 0.08$		[2] ABREU 99W	DLPH	$e^+e^- \rightarrow Z$
$1.19 \pm 0.14 \pm 0.07$		[3] ABREU 99W	DLPH	$e^+e^- \rightarrow Z$
$1.14 \pm 0.08 \pm 0.04$		[4] ABREU 99W	DLPH	$e^+e^- \rightarrow Z$
$1.11^{+0.19}_{-0.18} \pm 0.05$		[5] ABREU 99W	DLPH	$e^+e^- \rightarrow Z$
$1.29^{+0.24}_{-0.22} \pm 0.06$		[5] ACKERSTAFF 98G	OPAL	$e^+e^- \rightarrow Z$
$1.20 \pm 0.08 \pm 0.06$		[6] BARATE 98D	ALEP	$e^+e^- \rightarrow Z$
1.21 ± 0.11		[5] BARATE 98D	ALEP	$e^+e^- \rightarrow Z$
$1.32 \pm 0.15 \pm 0.07$		[7] ABE 96M	CDF	$p\overline{p}$ at 1.8 TeV
$1.46^{+0.22}_{-0.21}{}^{+0.07}_{-0.09}$		ABREU 96D	DLPH	Repl. by ABREU 99W
$1.10^{+0.19}_{-0.17} \pm 0.09$		[5] ABREU 96D	DLPH	$e^+e^- \rightarrow Z$
$1.16 \pm 0.11 \pm 0.06$		[5] AKERS 96	OPAL	$e^+e^- \rightarrow Z$
$1.27^{+0.35}_{-0.29} \pm 0.09$		ABREU 95S	DLPH	Repl. by ABREU 99W
$1.05^{+0.12}_{-0.11} \pm 0.09$	290	BUSKULIC 95L	ALEP	Repl. by BARATE 98D
$1.04^{+0.48}_{-0.38} \pm 0.10$	11	[8] ABREU 93F	DLPH	Excess $\Lambda\mu^-$, decay lengths
$1.05^{+0.23}_{-0.20} \pm 0.08$	157	[9] AKERS 93	OPAL	Excess $\Lambda\ell^-$, decay lengths
$1.12^{+0.32}_{-0.29} \pm 0.16$	101	[10] BUSKULIC 92I	ALEP	Excess $\Lambda\ell^-$, impact parameters

OCCUR=2
OCCUR=3
OCCUR=4
OCCUR=2
OCCUR=2

[1] Measured mean life using fully reconstructed $\Lambda_b^0 \rightarrow J/\psi\Lambda$ decays.
[2] Measured using $\Lambda\ell^-$ decay length.
[3] Measured using $p\ell^-$ decay length.
[4] This ABREU 99W result is the combined result of the $\Lambda\ell^-$, $p\ell^-$, and excess $\Lambda\mu^-$ impact parameter measurements.
[5] Measured using $\Lambda_c\ell^-$ and $\Lambda\ell^+\ell^-$.
[6] Measured using the excess of $\Lambda\ell^-$, lepton impact parameter.
[7] Measured using $\Lambda_c\ell^-$.
[8] ABREU 93F superseded by ABREU 96D.
[9] AKERS 93 superseded by AKERS 96.
[10] BUSKULIC 92I superseded by BUSKULIC 95L.

NODE=S061T;LINKAGE=AB
NODE=S061T;LINKAGE=N2
NODE=S061T;LINKAGE=N3
NODE=S061T;LINKAGE=N4
NODE=S061T;LINKAGE=LP
NODE=S061T;LINKAGE=KK
NODE=S061T;LINKAGE=AE
NODE=S061T;LINKAGE=C
NODE=S061T;LINKAGE=B
NODE=S061T;LINKAGE=D

b-baryon ADMIXTURE DECAY MODES (Λ_b,Ξ_b,Ω_b)

NODE=S061210;NODE=S061

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).

NODE=S061

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.*, $B \to D^{\pm}$ anything, the values usually are multiplicities, not branching fractions. They can be greater than one.

	Mode	Fraction (Γ_i/Γ)	Scale factor	
Γ_1	$p\mu^- \overline{\nu}$ anything	$(5.8^{+2.3}_{-2.0})$ %		DESIG=8
Γ_2	$p\ell\overline{\nu}_\ell$ anything	(5.6 ± 1.2) %		DESIG=9
Γ_3	p anything	(70 ± 22) %		DESIG=10
Γ_4	$\Lambda\ell^- \overline{\nu}_\ell$ anything	(3.8 ± 0.6) %		DESIG=5
Γ_5	$\Lambda\ell^+ \nu_\ell$ anything	(3.2 ± 0.8) %		DESIG=2
Γ_6	Λ anything	(39 ± 7) %		DESIG=7
Γ_7	$\Xi^- \ell^- \overline{\nu}_\ell$ anything	$(4.6 \pm 1.4) \times 10^{-3}$	1.2	DESIG=1

b-baryon ADMIXTURE (Λ_b, Ξ_b, Ω_b) BRANCHING RATIOS

NODE=S061215

$\Gamma(p\mu^-\overline{\nu}\text{anything})/\Gamma_{\text{total}}$ Γ_1/Γ

NODE=S061R8
NODE=S061R8

VALUE (%)	EVTS	DOCUMENT ID		TECN	COMMENT
$\mathbf{5.8^{+2.2}_{-1.9} \pm 0.8}$	125	[1] ABREU	95S	DLPH	$e^+e^- \to Z$

[1] ABREU 95S reports $[\Gamma(b\text{-baryon} \to p\mu^-\overline{\nu}\text{anything})/\Gamma_{\text{total}}] \times [B(\overline{b} \to b\text{-baryon at } Z)] = 0.0049 \pm 0.0011^{+0.0015}_{-0.0011}$ which we divide by our best (shown rounded) value $B(\overline{b} \to b\text{-baryon at } Z) = (8.4 \pm 1.1) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value. NODE=S061R8;LINKAGE=CA

$\Gamma(p\ell\overline{\nu}_\ell\text{anything})/\Gamma_{\text{total}}$ Γ_2/Γ

NODE=S061R9
NODE=S061R9

VALUE (%)	DOCUMENT ID		TECN	COMMENT
5.6±0.9±0.7	[1] BARATE	98V	ALEP	$e^+e^- \to Z$

[1] BARATE 98V reports $[\Gamma(b\text{-baryon} \to p\ell\overline{\nu}_\ell\text{anything})/\Gamma_{\text{total}}] \times [B(\overline{b} \to b\text{-baryon at } Z)] = (4.72 \pm 0.66 \pm 0.44) \times 10^{-3}$ which we divide by our best (shown rounded) value $B(\overline{b} \to b\text{-baryon at } Z) = (8.4 \pm 1.1) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value. NODE=S061R9;LINKAGE=A

$\Gamma(p\ell\overline{\nu}_\ell\text{anything})/\Gamma(p\text{anything})$ Γ_2/Γ_3

NODE=S061R10
NODE=S061R10

VALUE (%)	DOCUMENT ID		TECN	COMMENT
8.0±1.2±1.4	BARATE	98V	ALEP	$e^+e^- \to Z$

$\Gamma(\Lambda\ell^-\overline{\nu}_\ell\text{anything})/\Gamma_{\text{total}}$ Γ_4/Γ

NODE=S061R5
NODE=S061R5

The values and averages in this section serve only to show what values result if one assumes our $B(b \to b\text{-baryon})$. They cannot be thought of as measurements since the underlying product branching fractions were also used to determine $B(b \to b\text{-baryon})$ as described in the note on "Production and Decay of *b*-Flavored Hadrons."

NODE=S061R5

VALUE (%)	EVTS	DOCUMENT ID		TECN	COMMENT
3.8±0.6 OUR AVERAGE					
3.9±0.5±0.5		[1] BARATE	98D	ALEP	$e^+e^- \to Z$
3.5±0.4±0.5		[2] AKERS	96	OPAL	Excess of $\Lambda\ell^-$ over $\Lambda\ell^+$
3.6±0.9±0.5	262	[3] ABREU	95S	DLPH	Excess of $\Lambda\ell^-$ over $\Lambda\ell^+$
7.3±1.4±1.0	290	[4] BUSKULIC	95L	ALEP	Excess of $\Lambda\ell^-$ over $\Lambda\ell^+$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
seen	157	[5] AKERS	93	OPAL	Excess of $\Lambda\ell^-$ over $\Lambda\ell^+$
8.3±2.5±1.1	101	[6] BUSKULIC	92I	ALEP	Excess of $\Lambda\ell^-$ over $\Lambda\ell^+$

[1] BARATE 98D reports $[\Gamma(b\text{-baryon} \to \Lambda\ell^-\overline{\nu}_\ell\text{anything})/\Gamma_{\text{total}}] \times [B(\overline{b} \to b\text{-baryon at } Z)] = 0.00326 \pm 0.00016 \pm 0.00039$ which we divide by our best (shown rounded) value $B(\overline{b} \to b\text{-baryon at } Z) = (8.4 \pm 1.1) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value. Measured using the excess of $\Lambda\ell^-$, lepton impact parameter. NODE=S061R5;LINKAGE=KK

[2] AKERS 96 reports $[\Gamma(b\text{-baryon} \to \Lambda\ell^-\overline{\nu}_\ell\text{anything})/\Gamma_{\text{total}}] \times [B(\overline{b} \to b\text{-baryon at } Z)] = 0.00291 \pm 0.00023 \pm 0.00025$ which we divide by our best (shown rounded) value $B(\overline{b} \to b\text{-baryon at } Z) = (8.4 \pm 1.1) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value. NODE=S061R5;LINKAGE=AA

[3] ABREU 95S reports $[\Gamma(b\text{-baryon} \to \Lambda\ell^-\overline{\nu}_\ell\text{anything})/\Gamma_{\text{total}}] \times [B(\overline{b} \to b\text{-baryon at } Z)] = 0.0030 \pm 0.0006 \pm 0.0004$ which we divide by our best (shown rounded) value $B(\overline{b} \to b\text{-baryon at } Z) = (8.4 \pm 1.1) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value. NODE=S061R5;LINKAGE=CA

[4] BUSKULIC 95L reports $[\Gamma(b\text{-baryon} \to \Lambda \ell^- \overline{\nu}_\ell \text{anything})/\Gamma_{\text{total}}] \times [B(\overline{b} \to b\text{-baryon at } Z)] = 0.0061 \pm 0.0006 \pm 0.0010$ which we divide by our best (shown rounded) value $B(\overline{b} \to b\text{-baryon at } Z) = (8.4 \pm 1.1) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value. NODE=S061R5;LINKAGE=BL

[5] AKERS 93 superseded by AKERS 96. NODE=S061R5;LINKAGE=KA

[6] BUSKULIC 92I reports $[\Gamma(b\text{-baryon} \to \Lambda \ell^- \overline{\nu}_\ell \text{anything})/\Gamma_{\text{total}}] \times [B(\overline{b} \to b\text{-baryon at } Z)] = 0.0070 \pm 0.0010 \pm 0.0018$ which we divide by our best (shown rounded) value $B(\overline{b} \to b\text{-baryon at } Z) = (8.4 \pm 1.1) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value. Superseded by BUSKULIC 95L. NODE=S061R5;LINKAGE=BA

$\Gamma(\Lambda \ell^+ \nu_\ell \text{anything})/\Gamma(\Lambda \text{anything})$ — Γ_5/Γ_6

NODE=S061R2
NODE=S061R2

VALUE (units 10^{-2})	DOCUMENT ID	TECN	COMMENT
8.0±1.2±0.8	ABBIENDI 99L	OPAL	$e^+ e^- \to Z$
• • • We do not use the following data for averages, fits, limits, etc. • • •			
7.0±1.2±0.7	ACKERSTAFF 97N	OPAL	Repl. by ABBIENDI 99L

$\Gamma(\Lambda \text{anything})/\Gamma_{\text{total}}$ — Γ_6/Γ

NODE=S061R7
NODE=S061R7

VALUE (%)	DOCUMENT ID	TECN	COMMENT
39± 7 OUR AVERAGE			
42± 6±5	[1] ABBIENDI 99L	OPAL	$e^+ e^- \to Z$
$27^{+15}_{-9} \pm 3$	[2] ABREU 95C	DLPH	$e^+ e^- \to Z$
• • • We do not use the following data for averages, fits, limits, etc. • • •			
47± 7±6	[3] ACKERSTAFF 97N	OPAL	Repl. by ABBIENDI 99L

[1] ABBIENDI 99L reports $[\Gamma(b\text{-baryon} \to \Lambda \text{anything})/\Gamma_{\text{total}}] \times [B(\overline{b} \to b\text{-baryon at } Z)] = 0.035 \pm 0.0032 \pm 0.0035$ which we divide by our best (shown rounded) value $B(\overline{b} \to b\text{-baryon at } Z) = (8.4 \pm 1.1) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value. NODE=S061R7;LINKAGE=D

[2] ABREU 95C reports $0.28^{+0.17}_{-0.12}$ from a measurement of $[\Gamma(b\text{-baryon} \to \Lambda \text{anything})/\Gamma_{\text{total}}] \times [B(\overline{b} \to b\text{-baryon at } Z)]$ assuming $B(\overline{b} \to b\text{-baryon at } Z) = 0.08 \pm 0.02$, which we rescale to our best (shown rounded) value $B(\overline{b} \to b\text{-baryon at } Z) = (8.4 \pm 1.1) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value. NODE=S061R7;LINKAGE=AA

[3] ACKERSTAFF 97N reports $[\Gamma(b\text{-baryon} \to \Lambda \text{anything})/\Gamma_{\text{total}}] \times [B(\overline{b} \to b\text{-baryon at } Z)] = 0.0393 \pm 0.0046 \pm 0.0037$ which we divide by our best (shown rounded) value $B(\overline{b} \to b\text{-baryon at } Z) = (8.4 \pm 1.1) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value. NODE=S061R7;LINKAGE=C

$\Gamma(\Xi^- \ell^- \overline{\nu}_\ell \text{anything})/\Gamma_{\text{total}}$ — Γ_7/Γ

NODE=S061R1
NODE=S061R1

VALUE (units 10^{-3})	DOCUMENT ID	TECN	COMMENT
4.6±1.4 OUR AVERAGE Error includes scale factor of 1.2.			
3.6±1.2±0.5	[1] ABDALLAH 05C	DLPH	$e^+ e^- \to Z^0$
6.4±1.6±0.8	[2] BUSKULIC 96T	ALEP	Excess $\Xi^- \ell^-$ over $\Xi^- \ell^+$
• • • We do not use the following data for averages, fits, limits, etc. • • •			
7.0±2.8±0.9	[3] ABREU 95V	DLPH	Repl. by ABDALLAH 05C

[1] ABDALLAH 05C reports $[\Gamma(b\text{-baryon} \to \Xi^- \ell^- \overline{\nu}_\ell \text{anything})/\Gamma_{\text{total}}] \times [B(\overline{b} \to b\text{-baryon at } Z)] = (3.0 \pm 1.0 \pm 0.3) \times 10^{-4}$ which we divide by our best (shown rounded) value $B(\overline{b} \to b\text{-baryon at } Z) = (8.4 \pm 1.1) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value. NODE=S061R1;LINKAGE=D

[2] BUSKULIC 96T reports $[\Gamma(b\text{-baryon} \to \Xi^- \ell^- \overline{\nu}_\ell \text{anything})/\Gamma_{\text{total}}] \times [B(\overline{b} \to b\text{-baryon at } Z)] = (5.4 \pm 1.1 \pm 0.8) \times 10^{-4}$ which we divide by our best (shown rounded) value $B(\overline{b} \to b\text{-baryon at } Z) = (8.4 \pm 1.1) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value. NODE=S061R1;LINKAGE=C

[3] ABREU 95V reports $[\Gamma(b\text{-baryon} \to \Xi^- \ell^- \overline{\nu}_\ell \text{anything})/\Gamma_{\text{total}}] \times [B(\overline{b} \to b\text{-baryon at } Z)] = (5.9 \pm 2.1 \pm 1.0) \times 10^{-4}$ which we divide by our best (shown rounded) value $B(\overline{b} \to b\text{-baryon at } Z) = (8.4 \pm 1.1) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value. NODE=S061R1;LINKAGE=B

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

NODE=S061

ABAZOV	12U	PR D85 112003	V.M. Abazov *et al.*	(D0 Collab.)	REFID=54350
ABAZOV	07S	PRL 99 142001	V.M. Abazov *et al.*	(D0 Collab.)	REFID=52008
ABAZOV	05C	PRL 94 102001	V.M. Abazov *et al.*	(D0 Collab.)	REFID=50511
ABDALLAH	05C	EPJ C44 299	J. Abdallah *et al.*	(DELPHI Collab.)	REFID=51221
ABBIENDI	99L	EPJ C9 1	G. Abbiendi *et al.*	(OPAL Collab.)	REFID=47024
ABREU	99W	EPJ C10 185	P. Abreu *et al.*	(DELPHI Collab.)	REFID=47301
ACKERSTAFF	98G	PL B426 161	K. Ackerstaff *et al.*	(OPAL Collab.)	REFID=45875
BARATE	98D	EPJ C2 197	R. Barate *et al.*	(ALEPH Collab.)	REFID=45878
BARATE	98V	EPJ C5 205	R. Barate *et al.*	(ALEPH Collab.)	REFID=46151
ACKERSTAFF	97N	ZPHY C74 423	K. Ackerstaff *et al.*	(OPAL Collab.)	REFID=45488
ABE	96M	PRL 77 1439	F. Abe *et al.*	(CDF Collab.)	REFID=44810
ABREU	96D	ZPHY C71 199	P. Abreu *et al.*	(DELPHI Collab.)	REFID=44691
AKERS	96	ZPHY C69 195	R. Akers *et al.*	(OPAL Collab.)	REFID=44676
BUSKULIC	96T	PL B384 449	D. Buskulic *et al.*	(ALEPH Collab.)	REFID=44907
ABREU	95C	PL B347 447	P. Abreu *et al.*	(DELPHI Collab.)	REFID=44210
ABREU	95S	ZPHY C68 375	P. Abreu *et al.*	(DELPHI Collab.)	REFID=44466
ABREU	95V	ZPHY C68 541	P. Abreu *et al.*	(DELPHI Collab.)	REFID=44538
BUSKULIC	95L	PL B357 685	D. Buskulic *et al.*	(ALEPH Collab.)	REFID=44468
ABREU	93F	PL B311 379	P. Abreu *et al.*	(DELPHI Collab.)	REFID=43437
AKERS	93	PL B316 435	R. Akers *et al.*	(OPAL Collab.)	REFID=43541
BUSKULIC	92I	PL B297 449	D. Buskulic *et al.*	(ALEPH Collab.)	REFID=43221