



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

In the quark model Ω_b^- is ssb ground state. None of its quantum numbers has been measured.

Ω_b^- MASS

VALUE (MeV)	DOCUMENT ID	TECN	COMMENT
6045.8 $\pm$ 0.8 OUR AVERAGE			
6045.7 $\pm$ 0.5 $\pm$ 0.6	¹ AAIJ	23BD LHCB	pp at 7, 8, 13 TeV
6047.5 $\pm$ 3.8 $\pm$ 0.6	² AALTONEN	14B CDF	$p\bar{p}$ at 1.96 TeV
• • • We do not use the following data for averages, fits, limits, etc. • • •			
6045.9 $\pm$ 0.5 $\pm$ 0.6	³ AAIJ	23BD LHCB	pp at 7, 8, 13 TeV
6044.30 $\pm$ 1.20 $\pm$ 1.12	⁴ AAIJ	21AC LHCB	Repl. by AAIJ 23BD
6045.1 $\pm$ 3.2 $\pm$ 0.8	⁵ AAIJ	16O LHCB	Repl. by AAIJ 23BD
6046.0 $\pm$ 2.2 $\pm$ 0.5	⁶ AAIJ	13AV LHCB	Repl. by AAIJ 23BD
6054.4 $\pm$ 6.8 $\pm$ 0.9	⁷ AALTONEN	09AP CDF	Repl. by AALTONEN 14B
6165 $\pm$ 10 $\pm$ 13	⁸ ABAZOV	08AL D0	$p\bar{p}$ at 1.96 TeV

¹ Combines measurement using $\Omega_b^- \rightarrow J/\psi \Omega^-$ decays with results from AAIJ 16O and AAIJ 21AC taking into account correlations amongst systematic uncertainties. Uses Ξ_b^- mass $5797.33 \pm 0.24 \pm 0.29$ MeV from AAIJ 21.

² Uses $\Omega_b^- \rightarrow J/\psi \Omega^-$ and $\Omega_c^0 \pi^-$ decays, with the first evidence for $\Omega_b^- \rightarrow \Omega_c^0 \pi^-$ at 3.3σ significance.

³ Uses $\Omega_b^- \rightarrow J/\psi \Omega^-$ decays.

⁴ Uses $\Omega_b^- \rightarrow \Xi_c^+ K^- \pi^-$ and $\Xi_c^+ \rightarrow p K^- \pi^+$ decays. Reports the value of $6044.3 \pm 1.2 \pm 1.1^{+0.19}_{-0.22}$ MeV where the last uncertainty is due to the mass of Ξ_c^+ . We have combined the two systematic uncertainties in quadrature.

⁵ Reconstructed in $\Omega_b^- \rightarrow \Omega_c^0 \pi^-$, $\Omega_c^0 \rightarrow p K^- K^- \pi^+$ decays. Reference Ξ_b^- mass 5797.72 ± 0.6 MeV from AAIJ 14B.

⁶ Measured in $\Omega_b^- \rightarrow J/\psi \Omega^-$ with 19 ± 5 events.

⁷ Observed in $\Omega_b^- \rightarrow J/\psi \Omega^-$ decays with 16^{+6}_{-4} candidates, a significance of 5.5 sigma from a combined mass-lifetime fit.

⁸ Observed in $\Omega_b^- \rightarrow J/\psi \Omega^-$ decays with $17.8 \pm 4.9 \pm 0.8$ candidates, a significance of 5.4 sigma.

$m_{\Omega_b^-} - m_{\Lambda_b^0}$

VALUE (MeV)	DOCUMENT ID	TECN	COMMENT
426.4 $\pm$ 2.2 $\pm$ 0.4	AAIJ	13AV LHCB	pp at 7 TeV

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

VALUE (MeV)	DOCUMENT ID	TECN	COMMENT
248.50 $\pm$ 0.51 $\pm$ 0.37	¹ AAIJ	23BD LHCB	pp at 7, 8, 13 TeV
• • • We do not use the following data for averages, fits, limits, etc. • • •			
248.54 $\pm$ 0.51 $\pm$ 0.38	² AAIJ	23BD LHCB	pp at 7, 8, 13 TeV
247.3 $\pm$ 3.2 $\pm$ 0.5	³ AAIJ	16O LHCB	Repl. by AAIJ 23BD

¹ Uses $\Omega_b^- \rightarrow J/\psi \Omega$ decays combined with the result from AAIJ 160 obtained using $\Omega_b^- \rightarrow \Omega_c^0 \pi^-$, $\Omega_c^0 \rightarrow p K^- K^- \pi^+$ and $\Xi_b^- \rightarrow \Xi_c^0 \pi^-$, $\Xi_c^0 \rightarrow p K^- K^- \pi^+$ decays taking into account correlation of systematic uncertainties.

² Uses $\Omega_b^- \rightarrow J/\psi \Omega$ decays.

³ Uses $\Omega_b^- \rightarrow \Omega_c^0 \pi^-$, $\Omega_c^0 \rightarrow p K^- K^- \pi^+$ and $\Xi_b^- \rightarrow \Xi_c^0 \pi^-$, $\Xi_c^0 \rightarrow p K^- K^- \pi^+$ decays.

Ω_b^- MEAN LIFE

VALUE (10^{-12} s)	DOCUMENT ID	TECN	COMMENT
1.64 ± 0.16 OUR EVALUATION	(Produced by HFLAV)		

$1.65^{+0.18}_{-0.16}$ OUR AVERAGE

$1.78 \pm 0.26 \pm 0.05 \pm 0.06$	¹ AAIJ	160	LHCB	pp at 7, 8 TeV
$1.54^{+0.26}_{-0.21} \pm 0.05$	² AAIJ	14T	LHCB	pp at 7, 8 TeV
$1.66^{+0.53}_{-0.40} \pm 0.02$	² AALTONEN	14B	CDF	$p\bar{p}$ at 1.96 TeV

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

$1.13^{+0.53}_{-0.40} \pm 0.02$	³ AALTONEN	09AP	CDF	Repl. by AALTONEN 14B
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¹ Measured in $\Omega_b^- \rightarrow \Omega_c^0 \pi^-$, $\Omega_c^0 \rightarrow p K^- K^- \pi^+$ decays relative to $\Xi_b^- \rightarrow \Xi_c^0 \pi^-$, $\Xi_c^0 \rightarrow p K^- K^- \pi^+$ decays with reference Ξ_b^- mean life 1.599 ± 0.06 ps from AAIJ 14B.

² Measured in $\Omega_b^- \rightarrow J/\psi \Omega^-$ decays.

³ Observed in $\Omega_b^- \rightarrow J/\psi \Omega^-$ decays with 16^{+6}_{-4} candidates, a significance of 5.5 sigma from a combined mass-lifetime fit.

$\tau(\Omega_b^-)/\tau(\Xi_b^-)$ mean life ratio

VALUE	DOCUMENT ID	TECN	COMMENT
$1.11 \pm 0.16 \pm 0.03$	¹ AAIJ	160	LHCB pp at 7, 8 TeV

¹ Uses $\Omega_b^- \rightarrow \Omega_c^0 \pi^-$, $\Omega_c^0 \rightarrow p K^- K^- \pi^+$ and $\Xi_b^- \rightarrow \Xi_c^0 \pi^-$, $\Xi_c^0 \rightarrow p K^- K^- \pi^+$ decays.

Ω_b^- DECAY MODES

Mode	Fraction (Γ_i/Γ)	Scale factor/ Confidence level
Γ_1 $J/\psi \Omega^- \times B(b \rightarrow \Omega_b)$	$(1.4^{+0.5}_{-0.4}) \times 10^{-6}$	S=1.6
Γ_2 $p K^- K^- \times B(\bar{b} \rightarrow \Omega_b)$	$< 2.3 \times 10^{-9}$	CL=90%
Γ_3 $p \pi^- \pi^- \times B(\bar{b} \rightarrow \Omega_b)$	$< 1.5 \times 10^{-8}$	CL=90%
Γ_4 $p K^- \pi^- \times B(\bar{b} \rightarrow \Omega_b)$	$< 7 \times 10^{-9}$	CL=90%
Γ_5 $\Omega_c^0 \pi^-$	seen	

Γ_6	$\Omega_c^0 \pi^-, \Omega_c^0 \rightarrow p K^- K^- \pi^+$	seen
Γ_7	$\Xi_c^+ K^- \pi^-$	seen
Γ_8	$\Lambda_c^+ K^- K^-$	
Γ_9	$\Lambda_c^+ K^- \pi^-$	
Γ_{10}	$\Lambda_c^+ \pi^- \pi^-$	

Ω_b^- BRANCHING RATIOS

$\Gamma(J/\psi \Omega^- \times B(b \rightarrow \Omega_b)) / \Gamma_{\text{total}}$ Γ_1 / Γ

VALUE (units 10^{-6})	DOCUMENT ID	TECN	COMMENT
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1.4 $^{+0.5}_{-0.4}$ OUR AVERAGE Error includes scale factor of 1.6.

1.22 $\pm$ 0.12 $^{+0.31}_{-0.26}$	1,2 AAIJ	23BD LHCB	pp at 13 TeV
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2.6 $^{+1.0}_{-0.7}$ $\pm$ 0.4	3 AALTONEN	09AP CDF	p $\bar{p}$ at 1.96 TeV
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8 $\pm$ 4 $\pm$ 2	4 ABAZOV	08AL D0	p $\bar{p}$ at 1.96 TeV
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¹ AAIJ 23BD reports $[\Gamma(\Omega_b^- \rightarrow J/\psi \Omega^- \times B(b \rightarrow \Omega_b)) / \Gamma_{\text{total}}] / [B(\Xi_b^- \rightarrow J/\psi \Xi^- \times B(b \rightarrow \Xi_b^-))] = 0.120 \pm 0.008 \pm 0.008$ which we multiply by our best value $B(\Xi_b^- \rightarrow J/\psi \Xi^- \times B(b \rightarrow \Xi_b^-)) = (1.02^{+0.26}_{-0.21}) \times 10^{-5}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

² Reconstructing beauty baryons in the kinematic region $2 < \eta < 6$ and $p_T < 20$ GeV/c with their decays to a J/ψ meson and a hyperon.

³ AALTONEN 09AP reports $[\Gamma(\Omega_b^- \rightarrow J/\psi \Omega^- \times B(b \rightarrow \Omega_b)) / \Gamma_{\text{total}}] / [B(\Lambda_b^0 \rightarrow J/\psi(1S) \Lambda \times B(b \rightarrow \Lambda_b^0))] = 0.045^{+0.017}_{-0.012} \pm 0.004$ which we multiply by our best value $B(\Lambda_b^0 \rightarrow J/\psi(1S) \Lambda \times B(b \rightarrow \Lambda_b^0)) = (5.8 \pm 0.8) \times 10^{-5}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

⁴ ABAZOV 08AL reports $[\Gamma(\Omega_b^- \rightarrow J/\psi \Omega^- \times B(b \rightarrow \Omega_b)) / \Gamma_{\text{total}}] / [B(\Xi_b^- \rightarrow J/\psi \Xi^- \times B(b \rightarrow \Xi_b^-))] = 0.80 \pm 0.32^{+0.14}_{-0.22}$ which we multiply by our best value $B(\Xi_b^- \rightarrow J/\psi \Xi^- \times B(b \rightarrow \Xi_b^-)) = (1.02^{+0.26}_{-0.21}) \times 10^{-5}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(p K^- K^- \times B(\bar{b} \rightarrow \Omega_b)) / \Gamma_{\text{total}}$ Γ_2 / Γ

VALUE (units 10^{-5})	CL%	DOCUMENT ID	TECN	COMMENT
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$< 2.3 \times 10^{-4}$	90	1 AAIJ	21AH LHCB	pp at 7, 8, 13 TeV
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• • • We do not use the following data for averages, fits, limits, etc. • • •

$< 2.5 \times 10^{-4}$	90	2 AAIJ	17F LHCB	pp at 7, 8 TeV
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¹ AAIJ 21AH reports $[\Gamma(\Omega_b^- \rightarrow p K^- K^- \times B(\bar{b} \rightarrow \Omega_b)) / \Gamma_{\text{total}}] / [B(\Xi_b^- \rightarrow p K^- K^- \times B(b \rightarrow \Xi_b^-))] < 62 \times 10^{-3}$ which we multiply by our best value $B(\Xi_b^- \rightarrow p K^- K^- \times B(b \rightarrow \Xi_b^-)) = 3.7 \times 10^{-8}$.

² AAIJ 17F reports $[\Gamma(\Omega_b^- \rightarrow p K^- K^- \times B(\bar{b} \rightarrow \Omega_b)) / \Gamma_{\text{total}}] / [B(B^+ \rightarrow K^+ K^- K^+) / [B(\bar{b} \rightarrow B^+)]] < 18 \times 10^{-5}$ which we multiply by our best values $B(B^+ \rightarrow K^+ K^- K^+) = 3.40 \times 10^{-5}$, $B(\bar{b} \rightarrow B^+) = 40.8 \times 10^{-2}$.

$\Gamma(p\pi^-\pi^-\times B(\bar{b}\rightarrow\Omega_b))/\Gamma_{\text{total}}$ Γ_3/Γ

VALUE (units 10^{-5})	CL%	DOCUMENT ID	TECN	COMMENT
$<1.5 \times 10^{-3}$	90	¹ AAIJ	17F LHCb	pp at 7, 8 TeV

¹ AAIJ 17F reports $[\Gamma(\Omega_b^- \rightarrow p\pi^-\pi^-\times B(\bar{b}\rightarrow\Omega_b))/\Gamma_{\text{total}}] / [B(B^+ \rightarrow K^+K^-K^+)] / [B(\bar{b} \rightarrow B^+)] < 109 \times 10^{-5}$ which we multiply by our best values $B(B^+ \rightarrow K^+K^-K^+) = 3.40 \times 10^{-5}$, $B(\bar{b} \rightarrow B^+) = 40.8 \times 10^{-2}$.

 $\Gamma(pK^-\pi^-\times B(\bar{b}\rightarrow\Omega_b))/\Gamma_{\text{total}}$ Γ_4/Γ

VALUE (units 10^{-5})	CL%	DOCUMENT ID	TECN	COMMENT
$<7 \times 10^{-4}$	90	¹ AAIJ	17F LHCb	pp at 7, 8 TeV

¹ AAIJ 17F reports $[\Gamma(\Omega_b^- \rightarrow pK^-\pi^-\times B(\bar{b}\rightarrow\Omega_b))/\Gamma_{\text{total}}] / [B(B^+ \rightarrow K^+K^-K^+)] / [B(\bar{b} \rightarrow B^+)] < 51 \times 10^{-5}$ which we multiply by our best values $B(B^+ \rightarrow K^+K^-K^+) = 3.40 \times 10^{-5}$, $B(\bar{b} \rightarrow B^+) = 40.8 \times 10^{-2}$.

 $\Gamma(\Omega_c^0\pi^-)/\Gamma_{\text{total}}$ Γ_5/Γ

VALUE	DOCUMENT ID	TECN	COMMENT
seen	AAIJ	16O LHCb	pp at 7, 8 TeV

 $\Gamma(\Xi_c^+K^-\pi^-)/\Gamma(\Omega_c^0\pi^-, \Omega_c^0 \rightarrow pK^-K^-\pi^+)$ Γ_7/Γ_6

VALUE (units 10^2)	DOCUMENT ID	TECN	COMMENT
$2.2 \pm 0.2 \pm 1.0$	¹ AAIJ	21AC LHCb	pp at 7, 8, 13 TeV

¹ AAIJ 21AC reports $[\Gamma(\Omega_b^- \rightarrow \Xi_c^+K^-\pi^-)/\Gamma(\Omega_b^- \rightarrow \Omega_c^0\pi^-, \Omega_c^0 \rightarrow pK^-K^-\pi^+)] \times [B(\Xi_c^+ \rightarrow pK^-\pi^+)] = 1.35 \pm 0.11 \pm 0.05$ which we divide by our best value $B(\Xi_c^+ \rightarrow pK^-\pi^+) = (6.2 \pm 3.0) \times 10^{-3}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

 $\Gamma(\Lambda_c^+K^-\pi^-)/\Gamma(\Lambda_c^+K^-K^-)$ Γ_9/Γ_8

VALUE	DOCUMENT ID	TECN	COMMENT
<0.56	AAIJ	24T LHCb	pp at 7, 8, 13 TeV

 $\Gamma(\Lambda_c^+\pi^-\pi^-)/\Gamma(\Lambda_c^+K^-K^-)$ Γ_{10}/Γ_8

VALUE	DOCUMENT ID	TECN	COMMENT
<0.37	AAIJ	24T LHCb	pp at 7, 8, 13 TeV

 Ω_b^- REFERENCES

AAIJ	24T	JHEP 2408 132	R. Aaij	(LHCb Collab.)
AAIJ	23BD	PR D108 052008	R. Aaij <i>et al.</i>	(LHCb Collab.)
AAIJ	21	PR D103 012004	R. Aaij <i>et al.</i>	(LHCb Collab.)
AAIJ	21AC	PR D104 L091102	R. Aaij <i>et al.</i>	(LHCb Collab.)
AAIJ	21AH	PR D104 052010	R. Aaij <i>et al.</i>	(LHCb Collab.)
AAIJ	17F	PRL 118 071801	R. Aaij <i>et al.</i>	(LHCb Collab.)
AAIJ	16O	PR D93 092007	R. Aaij <i>et al.</i>	(LHCb Collab.)
AAIJ	14B	PL B728 234	R. Aaij <i>et al.</i>	(LHCb Collab.)
AAIJ	14T	PL B736 154	R. Aaij <i>et al.</i>	(LHCb Collab.)
AALTONEN	14B	PR D89 072014	T. Aaltonen <i>et al.</i>	(CDF Collab.)
AAIJ	13AV	PRL 110 182001	R. Aaij <i>et al.</i>	(LHCb Collab.)
AALTONEN	09AP	PR D80 072003	T. Aaltonen <i>et al.</i>	(CDF Collab.)
ABAZOV	08AL	PRL 101 232002	V.M. Abazov <i>et al.</i>	(D0 Collab.)