Ξ_b^- ***

April 19, 2009

The mass is taken from [**?**] . The lifetime is the experimentally measured value from [**?**].

No branching ratios have been measured. We have therefore chosen to add a number of two body modes with branching ratios calculated from various theoretical papers and model the remaining modes using partonic decays. The ratios of the partonic decays were calculated using the colour factor for the relative rates of the leptonic and direct $b \to c$ decays, colour exchanged decays were added with one third of the rate for the direct decays. The rates of the different quarks produced in the weak decays were calculated using the CKM matrix elements. The Ξ_b^- has mass 5792.9 MeV and is unstable. The Ξ_b^- has spin 1/2, charge -1 and is colour neutral. The Ξ_b^- is a baryon and is from the $(56, 0_0^+)$ 40plet.The properties of the particle and its antiparticle are taken to be charge-conjugate to each other. The decay length is 0.000417 m. The PDG code is 5132.

Branching Ratio	Rating	On/ Off	Outgoing Particles	Description	Decayer
0.203900	**	on	$s, \bar{c}, c, (sd)_0$	Partonic decay of Ξ_b^-.	Herwig::WeakPartonic::WeakPartonic100
0.201600	**	on	$d, \bar{u}, c, (sd)_0$	Partonic decay of Ξ_b^-.	Herwig::WeakPartonic::WeakPartonic100
0.091300	**	on	$c, \bar{u}, d, (sd)_0$	Partonic decay of Ξ_b^-.	Herwig::WeakPartonic::WeakPartonic100
0.089460	**	on	$c, \bar{c}, s, (sd)_0$	Partonic decay of Ξ_b^-.	Herwig::WeakPartonic::WeakPartonic100
0.073200	**	on	$\Xi_c^0, e^-, \bar{\nu}_e$	Semi-leptonic decay of Ξ_b^- with branching ratio calculated using the partial width from [**?**] and our lifetime estimate.	Herwig::SemiLeptonicBaryon::BaryonHeavy1
0.073200	**	on	$\Xi_c^0, \mu^-, \bar{\nu}_\mu$	Semi-leptonic decay of Ξ_b^- with branching ratio calculated using the partial width from [?] and our lifetime estimate.	Herwig::SemiLeptonicBaryon::BaryonHeavy1
0.043000	**	on	Ξ_c^0, D_s^{*-}	Decay of Ξ_b^- with branching ratio calculated using the partial width from [**?**] with a value of $a_1 = 1.4$ to get our value of the $\Xi_c\pi$ rate.	Herwig::BaryonFactorized::BottomBaryonVector
0.037000	**	on	$\Xi_c^0, a_1^-(1260)$	Decay of Ξ_b^- with branching ratio calculated using the form factors from [?] with a value of $a_1 = 1.4$ to get our value of the $\Xi_c\pi$ rate.	Herwig::BaryonFactorized::BottomBaryonVector
0.027000	**	on	Ξ_c^0, D_s^-	Decay of Ξ_b^- with branching ratio calculated using the partial width from [?] with a value of $a_1 = 1.4$ to get our value of the $\Xi_c\pi$ rate.	Herwig::BaryonFactorized::BottomBaryonScalar
0.026000	**	on	Ξ_c^0, ρ^-	Decay of Ξ_b^- with branching ratio calculated using the partial width from [?] with a value of $a_1 = 1.4$ to get our value of the $\Xi_c\pi$ rate.	Herwig::BaryonFactorized::BottomBaryonVector
0.023000	**	on	$e^-, \bar{\nu}_e, c, (sd)_0$	Partonic decay of Ξ_b^-.	Herwig::WeakPartonic::WeakPartonic100
0.023000	**	on	$\mu^-, \bar{\nu}_\mu, c, (sd)_0$	Partonic decay of Ξ_b^-.	Herwig::WeakPartonic::WeakPartonic100
0.021100	**	on	$\Xi_c^0, \tau^-, \bar{\nu}_\tau$	Semi-leptonic decay of Ξ_b^- with branching ratio calculated using the partial width from [?] and our lifetime estimate.	Herwig::SemiLeptonicBaryon::BaryonHeavy1
0.012300	**	on	$s, \bar{u}, c, (sd)_0$	Partonic decay of Ξ_b^-.	Herwig::WeakPartonic::WeakPartonic100
0.012000	**	on	$d, \bar{c}, c, (sd)_0$	Partonic decay of Ξ_b^-.	Herwig::WeakPartonic::WeakPartonic100
0.011000	**	on	$\tau^-, \bar{\nu}_\tau, c, (sd)_0$	Partonic decay of Ξ_b^-.	Herwig::WeakPartonic::WeakPartonic100
0.009000	**	on	Ξ_c^0, π^-	Decay of Ξ_b^- with branching ratio calculated using the partial width from [**?**] and our value of the lifetime.	Herwig::BaryonFactorized::BottomBaryonScalar

Table 1: The decay modes of the Ξ_b^- (continues).

Branching Ratio	Rating	On/ Off	Outgoing Particles	Description	Decayer
0.004800	**	on	$c, \bar{c}, d, (sd)_0$	Partonic decay of Ξ_b^-.	Herwig::WeakPartonic::WeakPartonic100
0.004800	**	on	$c, \bar{u}, s, (sd)_0$	Partonic decay of Ξ_b^-.	Herwig::WeakPartonic::WeakPartonic100
0.002200	**	on	$d, \bar{u}, u, (sd)_0$	Partonic decay of Ξ_b^-.	Herwig::WeakPartonic::WeakPartonic100
0.002200	**	on	$s, \bar{c}, u, (sd)_0$	Partonic decay of Ξ_b^-.	Herwig::WeakPartonic::WeakPartonic100
0.001500	**	on	Ξ_c^0, K^{*-}	Decay of Ξ_b^- with branching ratio calculated using the form factors from [?] with a value of $a_1 = 1.4$ to get our value of the $\Xi_c\pi$ rate.	Herwig::BaryonFactorized::BottomBaryonVector
0.001500	**	on	$\Xi_c^0, D^{*-}(2010)$	Decay of Ξ_b^- with branching ratio calculated using the form factors from [?] with a value of $a_1 = 1.4$ to get our value of the $\Xi_c\pi$ rate.	Herwig::BaryonFactorized::BottomBaryonVector
0.001000	**	on	$\Xi^-, J/\psi(1S)$	Decay of Ξ_b^- with branching ratio calculated using the partial width from [?] with a value of $a_2 = 0.474$ to get our value of the $\Lambda_b^0 \to J/\psi\Lambda^0$ rate.	Herwig::BaryonFactorized::BottomBaryonVector
0.001000	**	on	Ξ_c^0, D^-	Decay of Ξ_b^- with branching ratio calculated using the form factors from [?] with a value of $a_1 = 1.4$ to get our value of the $\Xi_c\pi$ rate.	Herwig::BaryonFactorized::BottomBaryonScalar
0.000840	**	on	$\Xi^-, \psi(2S)$	Decay of Ξ_b^- with branching ratio calculated using the partial width from [?] with a value of $a_2 = 0.474$ to get our value of the $\Lambda_b^0 \to J/\psi\Lambda^0$ rate.	Herwig::BaryonFactorized::BottomBaryonVector
0.000800	**	on	$e^-, \bar{\nu}_e, u, (sd)_0$	Partonic decay of Ξ_b^-.	Herwig::WeakPartonic::WeakPartonic100
0.000800	**	on	$\mu^-, \bar{\nu}_\mu, u, (sd)_0$	Partonic decay of Ξ_b^-.	Herwig::WeakPartonic::WeakPartonic100
0.000700	**	on	Ξ_c^0, K^-	Decay of Ξ_b^- with branching ratio calculated using the form factors from [?] with a value of $a_1 = 1.4$ to get our value of the $\Xi_c\pi$ rate.	Herwig::BaryonFactorized::BottomBaryonScalar
0.000300	**	on	$\tau^-, \bar{\nu}_\tau, u, (sd)_0$	Partonic decay of Ξ_b^-.	Herwig::WeakPartonic::WeakPartonic100
0.000200	**	on	Σ_c^0, K^-	Decay of Ξ_b^- with branching ratio calculated using the partial width from [?] and our value of the lifetime.	Herwig::Hw64::DecayME0
0.000100	**	on	$d, \bar{c}, u, (sd)_0$	Partonic decay of Ξ_b^-.	Herwig::WeakPartonic::WeakPartonic100
0.000100	**	on	$s, \bar{u}, u, (sd)_0$	Partonic decay of Ξ_b^-.	Herwig::WeakPartonic::WeakPartonic100
0.000100	**	on	$\Xi_c'^0, \pi^-$	Decay of Ξ_b^- with branching ratio calculated using the partial width from [?] and our value of the lifetime.	Herwig::Hw64::DecayME0

Table 1: The decay modes of the Ξ_b^-.

The Ξ_b^- decay modes are given in Table 1 and the total branching ratio is 1.

There is no mass generator for the Ξ_b^-. There is no width generator for the Ξ_b^-.

The particle was checked by Peter Richardson at 9:40:13 on the 4th of February 2009. The most recently changed decay mode was modified at 21:31:4 on the 23rd of September 2008. The particle data was last modified at 10:54:46 on the 6th of July 2008.