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Inclusive rare Λ_b decays to photon

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I present an analysis of the inclusive $H_b \to X_s \gamma$ decay with H_b a beauty baryon, in particular Λ_b , employing an expansion in the heavy quark mass at $calO(m_b^{-3})$ at leading order in α_s . For a polarized baryon I show the results for the distribution $\frac{d^2\Gamma}{dy d \cos \theta_P}$, with $y = 2E_{\gamma}/m_b$, E_{γ} the photon energy and θ_P the angle between the baryon spin vector and the photon momentum in the H_b rest-frame. I discuss the correlation between the baryon spin and the photon polarization, and show how effects of physics beyond the Standard Model can modify the photon polarization asymmetry.

I also present a method to treat the singular terms in the photon energy distribution.

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