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An improved study of the excited radiative decay $\Upsilon(2S) \to \eta_b(1S)\gamma$ using lattice NRQCD

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Recently Lewis and Woloshyn's exploratory study using lattice NRQCD to study the radiative decay $\Upsilon(2S) \to \eta_b(1S)\gamma$ found that next-to-leading order (v^6) contributions were large compared to the leading order (v^4)$result.Weexplainthissuppre$ term using a simple potential model. We then present our lattice QCD results obtained with three lattice spacings and high statistics. We employ improved actions, twisted boundary conditions, 1-loop perturbative matching, and Bayesian fitting methods. We conclude that lattice NRQCD can be used to accurately calculate this and other radiative bottomonium decay rates.

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