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EFT determination of the hybrid spin potential

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We study the spin-splitting in the spectrum of heavy quarkonium hybrids using non-relativistic effective theory. After sequentially integrating out modes at the scales m_Q , $m_Q v$ and Λ_{QCD} , we obtain the spin-dependent potential to order $1/m_Q^2$, in which non-perturbative contributions are given by gluonic correlators. With the hybrid potentials obtained from the lattice, we solve the relevant Schrodinger equation in the EFT, and obtain the spin-splitting by applying perturbation theory. Values of non-perturbative contributions are obtained by fitting to lattice data of the charmonium hybrid spectrum. With these non-perturbative parameters obtained, we predict the bottomonium hybrid spectrum.

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