

Quark Confinement and the Hadron Spectrum XI



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Magnetic transitions in heavy quarkonium

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We compute the magnetic dipole transitions between low lying Heavy Quarkonium states in a model independent way. We use the weak-coupling version of the effective field theory named potential NRQCD with the static potential exactly incorporated in the leading order Hamiltonian. The convergence for the $b\text{-}\bar{b}$ ground state is quite good, and also quite reasonable for the $c\text{-}\bar{c}$ ground state and the $b\text{-}\bar{b}$ 1P state. For all of them we give solid predictions. For the 2S decays the situation is less conclusive, yet our results are perfectly consistent with existing data, as the previous disagreement with experiment for the $Y(2S) \rightarrow \eta_b(1S)\gamma$ decay fades away. We also profit to compute some expectation values like the electromagnetic radius, r^2 , or p^2 . We find r^2 to be nicely convergent in all cases, whereas the convergence of p^2 is typically worse.

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