

Abstract Submitted
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Heavy Meson Mass Splittings¹ CHANDANA JAYALATH, Hampton University, JOSE GOITY, Hampton University/Jefferson Lab — The mass splittings in heavy mesons are studied in the framework of the heavy quark expansion. Within that framework, the masses of pseudoscalar and vector D- and B-mesons are analyzed to include effects due to the light quark masses $m_{u,d,s}$ as well as electromagnetic effects. The analysis is carried out to order $1/m_Q$ in the heavy quark mass expansion, and to first order in the light quark masses and the fine structure constant. The rather precise experimental knowledge of the heavy meson masses allows one to clearly separate the mentioned effects. For instance, one can identify and quantify the Coulomb and hyperfine electromagnetic effects. Careful analysis of the strong hyperfine splittings show that in order to have consistency with recent determinations of the heavy quark pole-mass ratio m_c/m_b it is necessary to include a $1/m_Q^2$ correction. Predictions can be made for the mass splittings ($m_{B^{*+}} - m_{B^+}$) and ($m_{B^{*0}} - m_{B^0}$), which are not experimentally known. Finally, we compare our results for the mass shift effects due to the light quark masses and to electromagnetism with those in the light meson sector.

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