QUARKONIUM

BY

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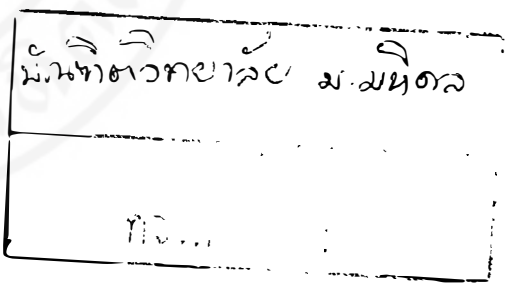

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ABSTRACT

In this thesis we present the basic properties of quarks, and study relations between Regge trajectories, spectrum and leptonic decay widths for quarkonium system. We use the nonrelativistic Schrödinger equation and vary the parameters entering in this equation, and study the dependence of these quantities. For this problem we use the asymptotic expansions and perturbation of the series to obtain the solutions for three superposed potentials. We use numerical calculations to obtain the results. From these results we plot Regge trajectories, and calculate the bound quark mass in the case with and without spin-dependent corrections. Finally, we calculate the leptonic decay widths and compare them with each other.