

A relativistic Dirac model for the study of heavy quarkonia

M. De Sanctis, D. Molina and C. Fernandez-Ramirez

We study the spectra of charmonium and bottomonium using a complete one gluon exchange approach based on a relativistic $q\bar{q}$ interaction model with Dirac spinors in momentum space. We do not perform any nonrelativistic approximation.

We fit the lowest-lying levels and predict the higher-lying resonances reproducing the overall structure of the spectra. The adopted interaction only includes a vector and a scalar contribution.

Screening factors are introduced in the momentum space to simulate the quark model *unquenching*.

The numerical values of the free parameters of the model are determined taking into account also the experimental uncertainties of the resonance energies. In this way, we are able to obtain the uncertainties of the theoretical resonance masses and the correlation among the free parameters of the model.