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Quarkonium states in strong magnetic fields

Based on the constraint formalism for the Dirac equation[1] the quarkonium states in a strong uniform magnetic field are studied. The relativistic equations governing the masses of the quarkonium consisting of various flavors in the singlet states are derived in the explicit form. The obtained spectrum is studied in detail. The derived spectrum is found to be in strong dependence on the magnetic field and on the confinement parameters. Relation of the derived quarkonium mass to the experimental results[2], as well as a decay and the quarkonium collapse in extreme large magnetic fields, are discussed.

1.H.W.Crater, P. van Alstine, Phys. Rev. D, v.36, 3007 (1987).

2.T.Yoshida, K. Suzuki, Phys. Rev. D, v.94, 074043 (2016).

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