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Quarkonia in Magnetic Field Created in Heavy Ion Collisions

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We study quarkonium motion in static magnetic field created in the early stage of heavy ion collisions. We investigated the Schroedinger equation for the quarkonium bound states in the magnetic field. The interaction between the heavy quarks includes the Cornell potential and spin-spin coupling. Due to the electromagnetic force on heavy quarks and in turn on the quarkonium states, the angular momentum is no longer conserved, and the singlets like η_c are mixed with the triplets like J/ψ. We numerically solved the equation by using the inverse power method and obtained the quarkonium masses, average radius, polarization, and the mixing of differernt spin and orbital angular momentum components as functions of the strength of the magnetic field. We found that the quarkonium elliptic flow is sizeable at high transverse momentum, which can be considered as a sensitive signature of the magnetic field formed in relativistic heavy ion collisions at RHIC and LHC energies.

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