

Polarized dissociation and spin alignment of Moving heavy quarkonium in a quark-gluon-plasma

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“Recent experiments have found spin alignment of J/ψ with respect to event plane in heavy ion collisions, suggesting a medium effect that is spin dependent. We propose a possible mechanism with polarized dissociation from the motion of J/ψ with respect to the medium.

We calculate polarized dissociation rate for quarkonium spin triplet state from spin chromomagnetic coupling in the potential non-relativistic QCD framework. This is done for the leading order gluo-dissociation process and next to leading order inelastic Coulomb scattering process. The polarized dissociation rate is expressed as a function of relative velocity between quarkonium and QGP and the quantization axis. Applying the polarized dissociation rate to quarkonium evolution with dissociation effect only in a Bjorken flow, we find the spin 0 state to dissociate less than the other spin states, leading to positive $\rho_{00} - 1/3$. Regeneration contribution is expected to give a contribution with the opposite sign.”

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