Contribution ID: **12** Type: **not specified**

X(3872) production in Pb-Pb collisions

Heavy ion collisions have provided an unique opportunity to study the nature of X(3872) compared with the electron-positron and proton-proton(anti-proton) collisions.
Abundant charm quarks are produced in the early stage of heavy ion collisions.
Their dynamical evolutions in the quark-gluon plasma can be described via the Langevin equation. We employ the Langevin+coalescence model to study the production of D meson, J/psi meson, X(3872) as a tetraquark and molecule state. We use the event-by-event Monte Carlo simulations to numerically solve the model, and present the centrality and momentum dependence of X(3872) production in Pb-Pb collisions. If the X(3872) is a compact hadron state, they are produced near the QCD phase boundary via the coalescence of heavy-light quarks. While for the molecule scenario, loosely bound meson-meson molecule can be destroyed by the partons (hadrons) in the QGP (hadronic medium) due to the small binding energy and the large geometry size. The final molecules are probably produced via D meson combination in the hadronic phase at the kinetic freeze-out boundary. Although the geometry size of the molecule is huge, the constraints on the relative momentum between D^0 and $\bar{D}^{*0}$ is much more strict that suppresses the molecule yield.

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