



Contribution ID: 576

Type: **Poster**

Real time simulation of the Chiral Magnetic Effect

Tuesday, 29 September 2015 16:30 (2 hours)

How do flavor degrees of freedom emerge in the quark-gluon plasma formed at heavy ion collisions is a challenging open question for both experiment and theory. In this work as a mean to approach this problem we study fermion production under a background electromagnetic field at real time. Using a simple enough time profile for such external electromagnetic field, allows us to define a proper Bogoliubov transformation between in and out states. In this way, we take on the problem of fermion production by numerically evolving the wave functions in real time and computing the proper observables, we obtained the net currents produced. In particular, the chiral magnetic effect is simulated considering finite parallel electric and magnetic components, exploring thus, its CP-odd domain. The net electric current produced by the chiral magnetic effect is computed for different values of the fermion mass in order to replicate the damping expected by the theory.

On behalf of collaboration:

NONE

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Session Classification: Poster Session

Track Classification: New Theoretical Developments