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# Lattice study of electromagnetic conductivity of quark-gluon plasma at finite baryon density and magnetic field

*Monday, 19 December 2022 18:55 (20 minutes)*

In this talk we present our study of the electromagnetic conductivity in dense quark-gluon plasma obtained within lattice simulations with $N_f = 2 + 1$ dynamical quarks. We employ stout improved rooted staggered quarks at the physical point and the tree-level Symanzik improved gauge action. To reconstruct electromagnetic conductivity from current-current correlators, we employ the modified Backus-Gilbert, computing the convolution of the spectral density with the target function. The computation of the conductivity is performed both in presence of non zero chemical potential and in presence of strong magnetic field. In the first case, the simulations are performed at imaginary chemical potential. Then, the results are analytically continued to real values of baryon chemical potential. Our study indicates that electromagnetic conductivity of quark-gluon plasma rapidly grows with the real baryon density. In the second case, we studied the conductivity of QGP in presence of two large values of the magnetic field, namely $eB = 4, 9\ GeV^2$. Our results may indicate a manifestation of the Chiral Magnetic Effect (CME). The conductivity is also studied at different values of the temperature for both the values of the magnetic fields. This allows us to extract the temperature dependence of the relaxation time related to the decrease of chirality due to the chirality-changing processes.

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