



Contribution ID: 194

Type: Poster

In-medium spectral properties of light hadrons in an arbitrary magnetic field

Tuesday, May 15, 2018 7:10 PM (30 minutes)

Quantum Chromodynamics in the presence of intense magnetic field reveals exotic phenomena like chiral magnetic effect, magnetic catalysis, inverse magnetic catalysis, vacuum superconductivity etc. Such a strong magnetic field is expected to be produced in non-central relativistic heavy ion collision experiments at RHIC and LHC. So, the study of “strongly” interacting hot and/or dense matter under external magnetic field has become one of the most important topics of research since a decade. In particular, the study of the properties of mesons at finite temperature and/or density in an external magnetic field is important in order to extract information about chiral phase transition parameters.

In this contribution, we will present the medium modification of pions and rho mesons under an arbitrary external magnetic field. The one-loop self energies of π and ρ are calculated using effective field theoretical techniques taking nucleon and pions as the loop particles respectively. The proton and charged pion propagators are modified due to the magnetic field using the full Schwinger proper time propagator. From the in-medium self energies, we obtained the effective mass and dispersion relations for π and ρ at the pole of the complete propagator calculated from the Dyson-Schwinger equation. We have also studied the spectral function as well as the detailed analytical structure of the self energy function of ρ . A non-trivial effect of magnetic field on these mesonic properties is observed.

Content type

Theory

Collaboration

Centralised submission by Collaboration

Presenter name already specified

Primary author: Mr GHOSH, Snigdha (Variable Energy Cyclotron Centre, Kolkata, India)

Co-authors: Mr MUKHERJEE, Arghya (Saha Institute of Nuclear Physics, Kolkata); Dr MANDAL, Mahatsab (Saha Institute of Nuclear Physics (IN)); Prof. SARKAR, Sourav (Variable Energy Cyclotron Centre, Kolkata); Prof. ROY, Pradip Kumar (Saha Institute of Nuclear Physics (IN))

Presenter: Mr GHOSH, Snigdha (Variable Energy Cyclotron Centre, Kolkata, India)

Session Classification: Poster Session

Track Classification: New theoretical developments