Contribution ID: **52** Type: **Oral**

Impact of external magnetic field on magnetic moment of Ξ baryon resonances

Friday 5 September 2025 15:45 (15 minutes)

The effective masses and magnetic moments of baryons are crucial for probing their internal structure and deepening our understanding of non-perturbative QCD. Hence, exploring the impact of external magnetic field in such nuclear matter is of key interest. In the present work, we have used the effective field theories to calculate the total magnetic moment of Ξ baryon resonances. The chiral SU(3) quark mean field model is used to calculate the in-medium masses of quarks and thus of baryons and using them within the SU(4) chiral constituent quark model we find the effective magnetic moment of Ξ baryon resonances. In previous studies, there have been precise experimental measurements of magnetic moment of Ξ baryon resonances. However, studies aimed at probing the impact of external magnetic fields have not yet been undertaken within this framework. We have examined the impact of external magnetic fields on the Ξ baryon resonances while incorporating the effect of other factors such as baryonic density and temperature. Calculation of the magnetic moments include the the contributions of the valence, sea and orbital angular moment individually realized through the chiral constituent quark model. The present findings throw new insights into the internal quark structure of the baryons. In our study, we have found significant variation in the values of magnetic moment observed as a function of baryonic density and temperature.

Author: DASTIDAR, Utsa

Co-authors: DUTT, Dr Suneel; KUMAR, Arvind (Dr B R Ambedkar National Institute of Technology Jalandhar India); DAHIYA, Harleen

Presenter: DASTIDAR, Utsa

Session Classification: Parallel Session