



Contribution ID: 415

Type: Postar

Magnetic Moment of the Σ_b^0 Baryon in Asymmetric Nuclear Matter

The magnetic moment of the Σ_b^0 baryon provides critical insights into the underlying quark dynamics and interactions within heavy-flavor baryons. Previous studies have calculated the valence quark contributions using theoretical models. In this work, we employ the chiral SU(3) quark mean field model for the first time to calculate the magnetic moment of the Σ_b^0 baryon. We initially focus on the valence quark contributions from its udb quark content, achieving high precision and demonstrating the robustness of the chiral SU(3) framework for baryonic magnetic moment calculations. To further enhance accuracy, we propose extending our analysis to include the contributions from sea quarks and orbital angular momentum. This comprehensive approach aims to yield a more precise value for the Σ_b^0 magnetic moment, facilitating refined theoretical predictions that closely align with experimental observations.

Field of contribution

Phenomenology

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Track Classification: Heavy ion and QCD