ID de Contribution: **4** Type: **Non spécifié**

Relativistic Hartree-Fock Chiral Lagrangians with confinement, nucleon finite size and short-range effects

jeudi 27 avril 2023 15:00 (30 minutes)

Understanding dense matter presents a big challenge at the actual time. On one hand, QCD, the fundamental interaction of nuclear matter is known to be non-perturbative at such low energy regimes, and on the other hand relying on numerical approaches to solve QCD, also known as lattice QCD, is blocked by what is known as the "sign problem".
Thus effective nuclear modeling may be employed to tackle the problem and efforts have been made to connect those descriptions to the fundamental theory of QCD.
In this talk, I present a relativistic approach to study nuclear matter with the specificity that it incorporates two main aspects of QCD at low energy: chiral symmetry breaking and color confinement. In addition, we consider the nucleon finite size and the interaction short range effects.

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