Contribution ID: **956** Type: **Poster Presentation**

Multilayer solutions for Near-BPS Skyrme Models

The Skyrme Model is considered a natural candidate for a low-energy effective theory of QCD, a point of view supported by results coming from 1/N_c expansion and holographic QCD. This framework leads to an attractive picture where baryons (and nuclei) emerge as topological solitons with a topological number identified to the baryon number A. Unfortunately, even the most naive Skyrme Model extensions have been plagued with the same problem: they predict large binding energies for the nuclei. The more recently proposed near-BPS class of Skyrme models provides a simple answer to this problem. The solutions nearly saturate the Bogomol'nyi bound which means that by construction they must have small binding energies. We present our most recent results regarding near-BPS Skyrmions and argue that they provide an improved description of nucleons and nuclei. More precisely, we address here the issue regarding the energy minimizer which remains unknown for A > 1 by proposing a more appropriate ansatz than the usual axially symmetric solution at least for large A.

Experimental Collaboration

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Session Classification: Poster session

Track Classification: QCD and Hadronic Physics