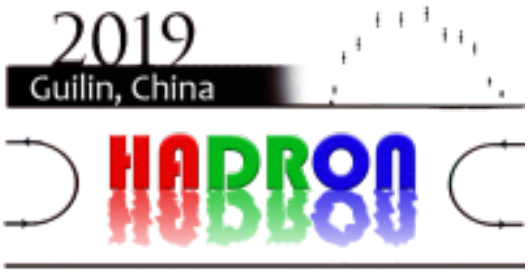

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Configuration mixing of positive parity excited baryons in the large Nc limit

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The asymptotic freedom in QCD allows for accurate calculations at high energy using perturbation theory. At low energies, typical of hadronic systems, a perturbative approach using the coupling constant as the expansion parameter is not appropriate. Baryon spectroscopy has been essential for our understanding of QCD in the low-energy, strong-coupling regime. In this context, the quark model which is based on the spin-flavor group O(3)×SU(2Nf) has since a long time been a useful tool to analyze the spectrum and properties of excited baryons. This symmetry is not something that follows from the fundamental QCD theory.
An analytic scheme to study the phenomenology of baryons and their excited states, whose connection with QCD is clearly stated, can be obtained by generalizing QCD from three colors and an SU(3) gauge group to Nc colors and an SU(Nc) gauge group.
In this talk, I will present a complete analysis of the masses of the positive parity excited baryons in the quark model O(3)×SU(6) multiplets contained in the N=2 band in the large Nc limit. We find that the mixing of the spin-flavor states is much simpler than what is naively expected in the quark model. The obtained mass degeneracies and mixing pattern constitute a signature of the contracted spin-flavor symmetry for baryons in this limit.

Primary author: WILLEMYNS, Cintia (Universite de Mons)

Co-author: Prof. SCOCCOLA, Norberto (CNEA - CONICET)

Presenter: WILLEMYNS, Cintia (Universite de Mons)

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