Abstract Submitted
for the DNP13 Meeting of
The American Physical Society

Analysis of Lattice Baryon Masses in $1/N_c$ expansion ISHARA FERNANDO, Hampton University, JOSE GOITY, Hampton University and Jefferson Lab — The $1/N_c$ expansion of QCD is a perturbative and successful framework for the phenomenology of ground state and excited state baryons. As proposed in [1], it is a systematic expansion in powers of $1/N_c$ and a good approximation, qualitatively and quantitatively, when $N_c = 3$. The $1/N_c$ expansion has been applied to the ground state baryons including studies of $SU(6)$ spin-flavor symmetry in [2]. A framework was suggested in [3] for excited baryons based on the $1/N_c$ expansion was implemented and analyzed with the physical masses from the Particle Data Group. And a successful calculation of the spin identified spectrum of Nucleons and Deltas has been carried out in lattice QCD [4]. Using mass operators organized according to the $1/N_c$ expansion, the analysis of lattice baryon masses has been completed for the negative parity baryons in the multiplet $[70, 1]^-$ of the $SU(6) \times O(3)$ representation, and results for that multiplet and the rest of the multiplets will be presented in this talk.

[1] G. 'tHooft Nucl.Phys.B72, 461(1974).
[2] R.F. Dashen, E.E. Jenkins, and A.V. Manohar Phys.Rev.D51 (1995).
[3] C.E. Carlson, C.D. Carone, J.L. Goity, R.F. Lebed Phys.Rev.D59 (1999).
[4] R.G. Edwards, J.J. Dudek, D.G. Richards, S.J. Wallace Phys.Rev.D84 (2011).

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Date submitted: 01 Jul 2013 Electronic form version 1.4