Abstract Submitted
for the APR17 Meeting of
The American Physical Society

Excited baryons and insensitivity to chiral symmetry breaking: variational Cornell-model computations FELIPE J. LLANES-ESTRADA, Univ Complutense Madrid, PEDRO BICUDO, MARCO CARDOSO, Inst. Sup. Tecnico Lisboa, TIM VAN CAUTEREN, Brants and Patents, Ghent, Belgium — We address Insensitivity to chiral symmetry breaking (sometimes also known as chiral symmetry restoration) in the highly excited light-quark baryon spectrum, a goal of experiments such as JLab and CBELSA/TAPS. As the only existing option to have all of confinement, highly excited states, and chiral symmetry, we adopt the Coulomb-gauge formalism of QCD, truncated to a linearly confining Cornell model. With a systematic and numerically intensive variational treatment up to 12 harmonic oscillator shells we access several angular (up to spin J=13/2) and radial excitations both for I=1/2 and I=3/2 baryons, and study in detail previously proposed chiral multiplets. While static-light and light-light meson spectra have clearly been shown to become less sensitive to chiral symmetry breaking than the ground states, the realization of chiral symmetry that we find in the baryon spectrum is more complicated than earlier expected.

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Date submitted: 30 Sep 2016 Electronic form version 1.4