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The baryon spectrum from lattice QCD

JUSTIN FOLEY, University of Utah

The spectrum of hadronic excitations observed in nature is believed to be described by the theory of the strong interaction known as Quantum Chromodynamics (QCD). Monte Carlo studies, based on the lattice regularization of QCD, provide a means of computing hadron properties from first principles. However, the reliable determination of excited-state energies from lattice QCD involves a number of significant technical challenges. I will report on recent progress in extracting the excited baryon spectrum from numerical studies which incorporate the effects of light and strange sea quarks, with light quark masses approaching the physical point. Crucially, these studies attempt to account for threshold effects in a systematic fashion. They will ultimately lead to reliable estimates for baryon masses, resonance energies and widths across a range of flavor sectors, which can justifiably be compared with experiment. Moreover, by varying the quark mass in these simulations and using a large and varied set of hadronic interpolators, one hopes to gain some insight into the degrees of freedom relevant to states of particular theoretical interest, such as the Roper resonance in the nucleon sector.