



Contribution ID: 195

Type: **Talk**

Heavy hadron spectrum from 2+1+1 flavor MILC lattices

Monday 3 November 2025 15:30 (20 minutes)

We study the mass spectra of heavy hadrons containing one or more bottom quarks, along with their hyperfine splittings and mass differences, using MILC's $N_f = 2+1+1$ HISQ gauge ensembles at three lattice spacings. To simulate the valence quark flavors, we employ a combination of lattice actions adapted to their masses: the NRQCD action is used for bottom quarks, the anisotropic Clover action is adopted for charm quarks, and the $\mathcal{O}(a)$ -improved Wilson-Clover action is used for strange and lighter (up/down) quarks. The strange quark masses are tuned to match the lattice value for the fictitious $\eta_s(\bar{s}s)$ pseudoscalar meson mass with 688.5 MeV. The bare bottom quark mass is tuned by equating the kinetic mass, while the bare charm quark mass is tuned using the pole mass of the respective heavy-strange meson with the physical values. Heavy hadron operators with at least one bottom quark are constructed by considering all possible combinations with charm, strange, and light quarks. We investigate ground state masses for all different bottom mesons and bottom baryons with various quantum numbers.

Parallel Session (for talks only)

Hadronic and nuclear spectrum and interactions

Authors: SHAIKH, Sabiar (National Institute of Science Education and Research, Bhubaneswar); Dr MOHANTA, Protick (The Institute of Mathematical Sciences, Chennai); Dr BASAK, Subhasish (National Institute of Science Education and Research, Bhubaneswar); Dr MADANAGOPALAN, Padmanath (The Institute of Mathematical Sciences, Chennai)

Presenter: SHAIKH, Sabiar (National Institute of Science Education and Research, Bhubaneswar)

Session Classification: Hadronic and nuclear spectrum and interactions