Contribution ID: **807** Type: **Parallel session talk**

Low-lying hadrons in the matrix model of two-color QCD at extreme strong coupling: quantum phases and the spin-puzzle

Saturday 20 July 2024 12:15 (15 minutes)

2-color QCD (SU(2) gauge theory coupled to fundamental fermions) has several novel features: for instance, enhanced Pauli-Gursey symmetry yields degeneracies between mesons and di/tetra-quark states. The quantum mechanical matrix model provides a simplified platform to directly probe the properties of low-energy (spin-0 and spin-1) hadrons. Using variational calculation, we numerically obtain the energy eigenstates and eigenvalues of the matrix model at ultra-strong coupling. In chiral limit, the effects of non-perturbative axial anomaly are quantified. Interestingly, in chiral limit, gluons contribute significantly (˜50%) to spin of hadrons and spin-0 hadrons are primarily composed of reducible connections. These effects are suppressed in heavy quark limit. Further, at strongly coupling, the system can undergo quantum phase transitions (in presence or absence of chemical potential). The ground state can be a spin-1 di-quark state which spontaneously breaks spatial rotational symmetry.

Alternate track

1. Formal Theory

I read the instructions above

Yes

Authors: BANDYOPADHYAY, ARKAJYOTI (Indian Institute of Technology, Bhubaneswar); Dr ACHARYYA, Nirmalendu (School of Basic Sciences, Indian Institute of Technology Bhubaneswar, Odisha, 752050, India); Mr AICH, Prasanjit (Centre for High Energy Physics, Indian Institute of Science, Bengaluru, 560012, India); Prof. VAIDYA, Sachindeo (Centre for High Energy Physics, Indian Institute of Science, Bengaluru, 560012, India)

Presenter: BANDYOPADHYAY, ARKAJYOTI (Indian Institute of Technology, Bhubaneswar)

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