Contribution ID: **81** Type: **Oral Presentation**

Constraining Beyond The Standard Model Nucleon Isovector Charges

Tuesday, 9 August 2022 14:40 (20 minutes)

At the TeV scale, low-energy precision observations of neutron characteristics provide unique probes of novel physics. Precision studies of neutron decay observables are susceptible to beyond the Standard Model (BSM) tensor and scalar interactions. The neutron electric dipole moment also has high sensitivity to new BSM CP-violating interactions. To fully utilise the potential of future experimental neutron physics programs, matrix elements of appropriate low-energy effective operators within neutron states must be precisely calculated. We present results from the QCDSF/UKQCD/CSSM collaboration for the isovector charges g_T, g_A and g_S using lattice QCD methods and the Feynman-Hellmann theorem. We use a flavour symmetry breaking method to systematically approach the physical quark mass using ensembles that span five lattice spacings and three volumes. We extend this existing flavour breaking expansion to also account for lattice spacing and finite volume effects in order to quantify all systematic uncertainties.

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Session Classification: QCD in searches for physics beyond the Standard Model

Track Classification: QCD in searches for physics beyond the Standard Model