Abstract Submitted
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Measuring the Neutron Spin Asymmetry A_1^n in the Valence Quark Region in Hall C at Jefferson Lab[1] MELANIE REHFUSS, Temple University, ZEIN-EDDINE MEZIANI, Argonne National Lab, E12-06-110/121 COLLABORATION — Due to the non-perturbative nature of QCD, making absolute predictions of nucleon spin structure is generally difficult. While successful lattice QCD calculations of spin and orbital angular momentum (OAM) of the quarks and gluons, integrated over their longitudinal momentum fraction (x_{bj}), exist, there remains much to learn about their x_{bj}-dependence. With the breakthrough of the quasi-PDFs formalism, confronting *ab-initio* calculations of unintegrated spin observables including OAM will be possible. The neutron spin asymmetry A_1^n at high x_{bj} is a key observable for probing nucleon spin structure since in the valence domain (x_{bj} >0.5) sea effects are expected to be negligible, where the total nucleon spin is considered to be carried by the valence quarks, and can enable us to study the role of quark OAM and other non-perturbative effects of the strong force. A_1^n was measured in the deep inelastic scattering region of 0.30 <x_{bj} <0.75 and 3 <Q^2 <10 (GeV/c)^2 in Hall C at Jefferson Lab using a 10.4 GeV longitudinally polarized electron beam, upgraded polarized ^{3}He target, and the High Momentum Spectrometer (HMS) and Super High Momentum Spectrometer (SHMS). The wide Q^2 range will explore possible Q^2 dependence on A_1^n, provide the first precision data in the valence quark region above x_{bj} = 0.61, and therefore test various predictions and ultimately *ab-initio* lattice QCD calculations.

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