

APR11-2011-020113

Abstract for an Invited Paper
for the APR11 Meeting of
the American Physical Society

Nucleon Spin Structure

KIERAN BOYLE, RIKEN BNL Research Center

Since discovering the nucleon was a composite structure, much has been learned about how its properties (charge, momentum, etc.) arise from the partons within. There has been significant recent activity to understand both the helicity and transverse spin structure. The Relativistic Heavy Ion Collider (RHIC) at Brookhaven National Laboratory allows unique access to study the spin structure through polarized proton-proton collisions. Results from polarized DIS measurements over the past 20 years have shown that the quark spin only contributes $\sim 25 - 30\%$ to the nucleon spin, indicating that the remainder comes from the gluon spin and parton orbital angular momentum. Measurements of the double helicity asymmetry A_{LL} in polarized proton collisions at RHIC can access the gluon spin contribution, ΔG . Recent result from the STAR and PHENIX Collaborations have been used in a global analysis of polarized data, and were shown to significantly constrain ΔG . New measurements at RHIC using the parity violating spin asymmetry in W boson production access the flavor dependent sea quark spin contributions. First results show good agreement with expectations based on DIS results. The first large data set is being taken this year. RHIC is also able to study the transverse spin structure of the proton, a field that has seen significant growth in recent years. In this talk, we will present our current understanding of the nucleon spin structure, and the role RHIC has played and will continue to play in expanding it.