

Absolute Calibration of the CNI Polarimeter-s at RHIC Using 125 GeV/A C Ions

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A polarized hydrogen jet target will be installed near an intersection point in RHIC in the next few years to calibrate absolutely the CNI polarimeters located in the blue and yellow rings. Comparison of elastic scattering asymmetries in the CNI angular range with spin-averaged protons incident on the polarized jet target and, alternately, polarized protons on the jet target run in the unpolarized mode will determine the calibration of the CNI polarimeters in the blue and yellow rings. We discuss here a direct and independent procedure to calibrate the CNI polarimeters in terms of the jet target polarization which will require the production of a carbon ion beam capability at RHIC. Once again two modes of asymmetry measurements are required: a carbon beam (maximum energy at RHIC = 125 GeV/A) incident on the polarized jet target with polarization P_T determines the asymmetry A_{PT} where A is the analyzing power for elastic scattering in the CNI angular range, and the asymmetry A_{PB} with protons with polarization P_B elastically scattered from the CNI polarimeter carbon foils at the same CM energy. For example, a 125 GeV/A C beam in the first case and a 125 GeV polarized beam in the second to calibrate the CNI polarimeters in polarized pp scattering at 125 GeV. The method is limited to energies up to the maximum energy carbon beams which can be accelerated at RMC. Other aspects of this method will be discussed including the statistical accuracy that can be obtained.