

Absolute Polarization Measurements At RHIC In The Coulomb Nuclear Interference Region

K.O. Eyser,^{*(1)} I. Alekseev,⁽²⁾ A. Bravar,⁽³⁾ G. Bunce,^(3,4) S. Dhawan,⁽⁵⁾
R. Gill,⁽³⁾ W. Haeberli,⁽⁶⁾ H. Huang,⁽³⁾ Y. Makdisi,⁽³⁾ I. Nakagawa,⁽⁷⁾
A. Nass,⁽⁸⁾ H. Okada,^(7,9) E. Stephenson,⁽¹⁰⁾ D. Sviridia,⁽²⁾ T. Wise,⁽⁶⁾
J. Wood,⁽³⁾ A. Zelenski⁽³⁾

(1) University of California, Riverside, CA 92951, USA

(2) Institute for Theoretical and Experimental Physics (ITEP), 117259 Moscow, Russia

(3) Brookhaven National Laboratory, Upton, NY 11973, USA

(4) RIKEN BNL Research Center, Upton, NY 11973, USA

(5) Yale University, New Haven, CT 06520, USA

(6) University of Wisconsin, Madison, WI 53706, USA

(7) RIKEN, Wako, Japan

(8) University of Erlangen, 91058 Erlangen, Germany

(9) Kyoto University, Kyoto, Japan

(10) Indiana University, Bloomington, IN 47408, USA

The Relativistic Heavy Ion Collider (RHIC) at Brookhaven National Laboratory (BNL) is the world's first polarized proton collider which currently delivers center of mass energies of 200 GeV. For polarimetry, proton-Carbon and proton-proton scattering is used in the Coulomb Nuclear Interference (CNI) region at low momentum transfer $-t$. While two proton-Carbon polarimeters provide fast polarization measurements with small statistical errors at several times during an accelerator store, a polarized Hydrogen Jet device is needed for absolute normalization over multiple stores. The jet polarization is constantly monitored in a Breit-Rabi unit.

In 2005 the Jet polarimeter has been used with both RHIC beams and can, therefore, be combined with both Carbon polarimeters. Systematic errors have been studied in detail and results were compared to the previous run in 2004 when the Jet polarimeter had an extended acceptance for only one beam. Results of the analyzing power at 100 GeV have been published and other energies up to the RHIC goal of 250 GeV are under investigation.