



国立研究開発法人理化学研究所 仁科加速器科学研究センター
第304回 RIBF核物理セミナー
RIKEN Nishina Center for Accelerator Based Science
The 304th RIBF Nuclear Physics Seminar

Direct photon single spin asymmetries and gluon dynamics

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One of the aims of the PHENIX experiment at the Relativistic heavy ion collider RHIC in Brookhaven, New York is to understand the spin-structure of the nucleon. It gives us an insight into the strong interaction, QCD, which is responsible for nearly all the visible mass of the universe that is formed by nucleons and nuclei.

Using single spin asymmetries of proton-proton collisions where the spin of the beam is transversely polarized, one can obtain information about the spin-orbit effects between the nucleon and its constituents, the quarks and gluons. At mid-rapidity these interactions are mostly originating from hard scattering between quarks and gluons from the two protons, but in the asymmetries both initial and final state effects can normally be present. When selecting direct photons one effectively can switch off the final state effects and can identify the gluon dynamics in the polarized proton. Experimentally, selecting direct photons is difficult since the rates are relatively low and meson decays into photons create backgrounds that need to be very well understood. PHENIX has managed to extract these direct photon single spin asymmetries for the very first time at a collider.

In this presentation I will highlight the physics of transverse single spin asymmetries and what we can learn about QCD and the nucleon spin structure by it. I will also present how this measurement was performed to obtain the direct photon asymmetries.

Feb. 8th (Tue), 2022 13 : 30 ~
via Zoom Meeting System



* The talk will be given in English language.

Contact: Nuclear Physics Seminar Organizing Committee

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