

HAW05-2005-000458

Abstract for an Invited Paper
for the HAW05 Meeting of
the American Physical Society

Helicity Distributions of Partons in the Nucleon from HERMES Experiment

TOSHI-AKI SHIBATA, Tokyo Institute of Technology

Deep inelastic electron scattering is one of the representative methods to reveal the inner structure of the nucleon. Electron itself is a point like particle. It is therefore suited to be used for the investigation of nucleon structure. When the scattered electron is detected and momentum analysed, 4 momenta of the exchanged virtual photon are determined. From these kinematical variables, one can calculate Bjorken scaling variable X event by event. In addition to the scattered electron, produced hadrons are detected and identified. 'Nucleon spin problem' started by EMC in 1980's is being studied with novel experimental technique. HERMES is a deep inelastic scattering experiment at DESY-HERA. Longitudinally polarized positron/electron beam of 27.6 GeV is available at HERA. Physics results with longitudinally polarized hydrogen and deuteron targets are presented in this talk. These targets are internal gas targets. Produced hadrons are detected and identified with Ring Imaging Cherenkov Counter (RICH). From the double spin asymmetry, the spin dependent (helicity) structure function was obtained. Quark flavor decomposition of helicity distributions was carried out making use of information on hadron identification. A positive distribution of u quark and negative distribution of d quark were extracted with a high precision. The polarizations of the sea quarks are small.