



Contribution ID: 137

Type: **not specified**

Azimuthal distributions of charged hadrons, pions, and kaons produced in deep-inelastic scattering off unpolarized protons and deuterons

Tuesday 27 March 2012 12:00 (25 minutes)

The azimuthal $\cos \phi$ and $\cos 2\phi$ modulations of the distribution of hadrons produced in unpolarized semi-inclusive deep-inelastic scattering of electrons and positrons off hydrogen and deuterium targets have been measured at the HERMES experiment.

For the first time these modulations were determined in a four-dimensional kinematic space for positively and negatively charged pions and kaons separately, as well as for unidentified hadrons.

These azimuthal dependences are sensitive to the transverse motion and polarization of the quarks within the nucleon via, e.g., the Cahn, Boer-Mulders and Collins effects.

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Session Classification: Spin physics

Track Classification: Spin physics