Contribution ID: **5** Type: **not specified**

Study of nucleon spin structure by the Drell-Yan process in the COMPASS experiment

Friday, 11 May 2012 10:00 (30 minutes)

The Parton Distribution Functions (PDFs) and the spin structure of the nucleon are important topics studied by COMPASS in Semi-Inclusive Deep Inelastic Scattering. The Drell-Yan process is a complementary way to access the Transverse Momentum Dependent PDFs (TMD PDFs), using a transversely polarized target.

Studying the angular distributions of dimuons from the Drell-Yan reactions in the scattering of a negative pion beam with 190 GeV/c negative pions beam momentum off a transversely polarized proton target we are able to extract the azimuthal spin asymmetries and to access to the various TMD PDFs, like Sivers and Boer-Mulders functions. The start of the COMPASS DY experiment is scheduled for 2014. An important beam test has been already performed in 2009, using a hadron absorber prototype downstream of the target and a high intensity beam, to understand the absorber background reduction factors and the spectrometer response, and also to verify our results from Monte-Carlo simulations.

COMPASS aims at performing the first DY experiment with a transversely polarized target.

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