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Sivers asymmetries of charged pions in muons semi inclusive deep inelastic scattering off polarized protons in PYTHIA8+StringSpinner model

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The semi-inclusive deep inelastic scattering (SIDIS) of a lepton on a polarized proton provides a means of studying the internal structure of the proton. This scattering gives an observable, the Sivers asymmetry, which can be measured for positive and negative pions productions within the scattering event. This measurement allows access to the Sivers parton distribution function (PDF).

In this study, we have devised a methodology for calculating the Sivers asymmetry using PYTHIA8 and modified in this report StringSpinner plugin for charged pions in the muon SIDIS on a polarized proton. To validate the developed method, we present a comparison between the calculated Sivers asymmetries as a function of the Björken variable x_{Bj} and the experimental values obtained by the COMPASS experiment.

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