

The LHCSpin project

A polarized gaseous target, operated in combination with the high-energy and high-intensity LHC beams, has the potential to open new physics frontiers and to deepen our understanding of the strong interaction in the non-perturbative regime of QCD. Specifically, the LHCspin project aims to perform spin-physics studies in high-energy polarized fixed-target collisions using the LHCb detector. Being designed and optimized for the detection of heavy hadrons, LHCb will allow to probe the nucleon structure through, e.g., the inclusive production of c- and b-hadrons, and ideal tool to access the essentially unexplored spin-dependent gluon TMDs. This configuration will allow to explore the nucleon internal dynamics at unique kinematic conditions, including the poorly explored high x-Bjorken and high x-Feynman regimes. With the installation of the proposed setup, LHCb will become the first experiment delivering simultaneously unpolarized beam-beam collisions at 14 TeV and both polarized and unpolarized beam-target collisions at center-of-mass energies of the order of 100 GeV. The current status of the LHCspin project is presented, with a focus on the anticipated timeline for its experimental implementation.

Primary authors: Prof. CIULLO, Giuseppe (University of Ferrara); Prof. LENISA, Paolo (University of Ferrara); LUCIANO, Pappalardo (University of Ferrara); DI NEZZA, Pasquale (INFN Frascati)

Presenter: LUCIANO, Pappalardo (University of Ferrara)

Track Classification: Future facilities and experiments