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# The LHCSpin project

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The LHCSpin project aims to bring both unpolarized and polarized physics at the LHC through the installation of a gaseous fixed target at the upstream end of the LHCb detector. The forward geometry of the LHCb spectrometer is perfectly suited for the reconstruction of particles produced in fixed-target collisions. The fixed-target configuration, with center-of-mass energies ranging from √s=115 GeV in pp interactions to √sNN=72 GeV in collisions with Pb beams, allows to cover a wide backward rapidity region, including the poorly explored high x-Bjorken and high negative x-Feynman regimes. The project has several ambitious goals regarding new-era quantitative searches in QCD through the study of the nucleon's internal dynamics in terms of both quarks and gluons degrees of freedom. In particular, the use of transversely polarized H and D targets will allow to study the quarks TMDs in pp collisions at unique kinematic conditions. Furthermore, being LHCb specifically designed for heavy-flavor physics, efficiently reconstructed final states with c- or b-quarks (e.g. in inclusive quarkonia production) will provide access to the so-far unknown gluons TMDs. The status of the project is presented along with a selection of physics opportunities.

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