

# XXIV International Workshop on Deep-Inelastic Scattering and Related Subjects (DIS16)



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## **TMD studies with a fixed-target experiment using the LHC beams**

*Wednesday, April 13, 2016 2:30 PM (20 minutes)*

We report on the opportunities for spin physics and Transverse-Momentum Dependent distribution (TMD) studies at a future multi-purpose fixed-target experiment using the proton LHC beams extracted by a bent crystal or using an internal gas target. The LHC multi-TeV beams allow for the most energetic fixed-target experiments ever performed, opening new domains of particle and nuclear physics and complementing that of collider physics, in particular that of RHIC and the EIC projects. The luminosity achievable with AFTER@LHC surpasses that of RHIC by more than 3 orders of magnitude in a similar energy region. In unpolarised proton-proton collisions, AFTER@LHC allows for measurements of TMDs such as the Boer-Mulders quark distributions, the distribution of unpolarised and linearly polarised gluons in unpolarised protons. Using polarised targets, one can measure transverse single-spin asymmetries (SSA) of quark and gluon sensitive probes, such as, respectively, Drell-Yan pair and quarkonium production. The fixed-target mode has the advantage to allow for measurements in the target-rapidity region, namely at large  $x$  in the polarised nucleon. We will present figures-of-merit for Drell-Yan SSA and prospects for SSA for gluon sensitive probes.

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