

Future Drell-Yan physics program at the COMPASS experiment

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COMPASS is a fixed-target high energy physics experiment at the SPS at CERN [1]. One of the main tasks of this experiment is the study of the spin structure of the nucleon accessed via the deep inelastic scattering of polarized leptons off both longitudinally and transversely polarized proton or deuteron. Results obtained so far by the collaboration play an important role in the general understanding of the three-dimensional nature of the nucleon in terms of Transverse Momentum Dependent (TMD) parton distribution functions (PDFs) and fragmentation functions (FFs). For instance, measurements done by COMPASS and HERMES experiments together with the BELLE experimental data allowed a first extraction of the transversity and Sivers TMD DFs and the Collins FF.

Now COMPASS enters in its second phase and along with the GPD measurement another key-point of the future program is the study of the Drell-Yan process with a pion beam and polarized target. Such a measurement will be an important test of the universality of TMD PDFs and TMD factorization approach in the description of SSA, providing a unique opportunity to use the same spectrometer to access in Drell-Yan process TMD PDFs previously measured with SIDIS reactions. For instance, one of the expected results is the confirmation of predicted sign-change of the Sivers and Boer-Mulders functions in the Drell-Yan reaction.

In this contribution we make a review of the future COMPASS Drell-Yan physics program and of the important technical details of the project.

- [1] P. Abbon *et al.* [COMPASS Collaboration], Nucl. Instrum. Meth. A **577** (2007) 455 [and references therein].
- [2] [COMPASS Collaboration] COMPASS-II Proposal, CERN-SPSC-201-014, SPSC-P-340, 17 May 2010 [and references therein].

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