Contribution ID: **21**   Type: **Oral**

Unveiling Nucleon GPDs through Drell-Yan Processes

The contribution of parton orbital motion to the nucleon spin structure is encoded in transverse-momentum dependent distributions (TMDs) and generalized parton distributions (GPDs). These distributions are primarily accessed through lepton-induced processes such as semi-inclusive deep-inelastic scattering (SIDIS) and Deeply Virtual Compton Scattering (DVCS). As a complementary approach, measurements of (un)polarized Drell-Yan process with hadron beams provide a unique probe, allowing critical tests of the universality properties of TMDs and GPDs between space-like and time-like regimes.

In this talk, we will discuss the interesting results of TMDs results explored by the Drell-Yan process and present the future prospects for accessing nucleon GPDs via the measurements of exclusive pion-induced Drell-Yan process at J-PARC.

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Session Classification: Parallel

Track Classification: Three-dimensional structure of the nucleon: generalized parton distributions and form factors