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Drell-Yan Process and Transversity

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Boer-Mulders function, Sivers function and transversity are known as transverse momentum dependent parton distribution functions of the nucleon, **TMD**. They have received much attention in recent years as they provide new perspectives on the hadron structure and QCD. Azimuthal distribution of cross section in Drell-Yan scattering, where quark and anti-quark annihilate and produce a charged lepton pair, has been measured in various experiments. A unique feature of the Drell-Yan process is that no fragmentation functions are involved to study TMD, unlike in deep inelastic scattering where hadron production is required. The azimuthal distribution in the Drell-Yan cross section would provide direct information on the Boer-Mulders function, and be complementing to the related measurements in the deep inelastic scattering. Sivers function and transversity play a role in transversely polarized Drell-Yan scattering. Single spin asymmetry of the Drell-Yan cross section is sensitive to the Sivers function, and the double spin asymmetry is proportional to the product of transversity distributions. Polarized Drell-Yan experiments have been planned at various laboratories. The experimental results related TMD from the Drell-Yan scattering experiments and future prospects will be discussed.