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Exclusive meson production at COMPASS

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Hard exclusive leptoproduction of mesons on nucleons has played an important role in studies of the hadron structure and recently gained renewed interest as it allows access to generalised parton distributions (GPDs). GPDs provide a novel and comprehensive description of the partonic structure of the nucleon and contain a wealth of new information. For instance GPDs give a description of the nucleon as an extended object, referred to as 3-dimensional nucleon tomography, and give access to the orbital angular momentum of quarks. Exclusive meson production is sensitive to various types of GPDs for different flavours depending on the quark content and the quantum numbers of the meson (ρ^0, ϕ, π^0, ...).

In this talk we will summarize recent measurements of exclusive vector meson production performed by the COMPASS Collaboration. In particular, recent results on single-spin and double-spin asymmetries for exclusive ρ^0 and ω production measured on the transversely polarized proton target will be presented. Some of these asymmetries are sensitive to the GPDs E, which are related to the orbital angular momentum of quarks. Other asymmetries are sensitive to the chiral-odd, transverse GPDs H_T. Our results provide the first experimental evidence from the hard exclusive vector meson production for the existence of non-vanishing GPDs H_T.

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