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The t -dependence of the pure DVCS cross-section at COMPASS

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A major part of the COMPASS-II program will be dedicated to the investigation of generalized parton distributions (GPDs) and transverse momentum dependent parton distributions (TMDs), which aim for the most complete description of the partonic structure of the nucleon.

GPDs are experimentally accessible via lepton-induced exclusive reactions, in particular the Deeply Virtual Compton Scattering (DVCS) and Deeply Virtual Meson Production (DVMP). At COMPASS, those processes are investigated using an high intensity muon beam of 160 GeV and a 2.5 m-long liquid hydrogen target. In order to optimize the selection of exclusive reactions at those energies, the target is surrounded by a new barrel-shaped time-of-flight system to detect the recoiling particles.

COMPASS-II covers the up to now unexplored x_{Bj} domain ranging from 0.01 to 0.15. The option to change simultaneously the charge and polarization of the muon beam allows to perform DVCS measurements on a proton target and to access the Compton form factor related to the dominant GPD H , and thus to provide new experimental constraints on the theoretical GPD models in the intermediate x_{Bj} regime.

From the sum of cross-sections measured with positive and negative beam polarity, the pure DVCS cross-section can be extracted.

Pilot measurements for the COMPASS II program allow for an extraction of the t -dependence of the pure DVCS cross-section in a single x_{Bj} bin.

This provides first information on the nucleon transverse size in an up to now uncharted x_{Bj} regime.

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