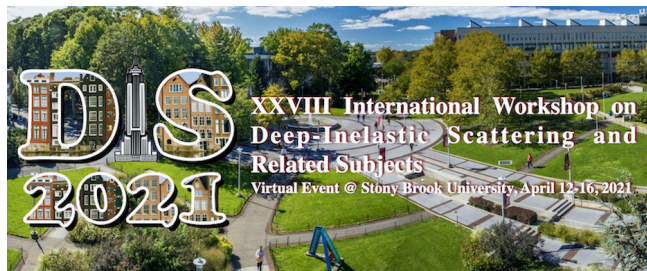


XXVIII International Workshop on Deep-Inelastic Scattering and Related Subjects



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Spin Density Matrix Elements in Exclusive ρ^0 Meson Muoproduction at COMPASS

Wednesday, 14 April 2021 10:54 (18 minutes)

We will present results on Spin Density Matrix Elements (SDMEs) measured in hard exclusive ρ^0 meson muoproduction on the proton at COMPASS using 160 GeV/c polarised μ^+ and μ^- beams scattering off a liquid hydrogen target. The measurement covers the range $5 \text{ GeV}/c^2 < W < 17 \text{ GeV}/c^2$, $1.0 (\text{GeV}/c)^2 < Q^2 < 10.0 (\text{GeV}/c)^2$ and $0.01 (\text{GeV}/c)^2 < p_T^2 < 0.5 (\text{GeV}/c)^2$. Here, Q^2 denotes the virtuality of exchanged photon, W the mass of final hadronic system and p_T the transverse momentum of the ρ^0 meson with respect to the virtual-photon direction. The kinematic dependences of SDMEs and of related observables will be presented. The measured non-zero SDMEs for transitions of transversely polarised virtual photons to longitudinally polarised vector mesons ($\gamma_T^* \rightarrow V_L$) indicate a significant violation of s -channel helicity conservation. Additionally, we observe a dominant contribution of natural-parity-exchange transitions and a small contribution of unnatural-parity-exchange transitions at small values of W . The results provide important input for modelling Generalised Parton Distribution (GPDs). In particular, they may allow to evaluate in a model-dependent way the role of parton-helicity flip GPDs ("transversity GPDs") in exclusive ρ^0 production.

Primary authors: Dr AUGUSTYNIAK, Witold (National Centre for Nuclear Research Warsaw,poland); PARSAMYAN, Bakur (University of Turin, INFN and JINR)

Presenter: Dr AUGUSTYNIAK, Witold (National Centre for Nuclear Research Warsaw,poland)

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