

## CLAS12 experiments with a transversely polarized target

In the recent years, it has been realized that deep-inelastic scattering with polarization control could provide a variety of spin and azimuthal angle dependent observables sensitive to the quark-gluon interactions. New parton distributions and fragmentation functions have been introduced to describe the rich complexity of the hadron structure and move towards a multi-dimensional imaging of the underlying parton correlations. Besides the hard probe scale, these functions explicitly depend on the parton transverse degrees of freedom at the scale of confinement. Their study promises to open an unprecedented gateway to the peculiar nature of the strongly interacting force.

The CLAS12 experiments with a transversely polarized target (Run-Group H, or RGH) will have an unprecedented sensitivity to several crucial observables whose current knowledge is severely limited by the sparse data available. Distinctive features, common to all three RGH experiments, are the precise measurement of parton distributions and phenomena in the poorly explored valence region (large Bjorken- $x$ ) where current models project their magnitude to be peaking, a luminosity at least one order of magnitude higher than the previous experiments, a large acceptance detector for the disentanglement of the various correlations and kinematic regimes, and an excellent particle identification capability to access flavor sensitivity.

This work presents a selection of upcoming measurements planned at CLAS12 to address the mysteries of the nucleon structure from a modern point of view.

**Primary author:** CONTALBRIGO, Marco (INFN Ferrara)

**Presenter:** CONTALBRIGO, Marco (INFN Ferrara)

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