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Exclusive reactions and the PbWO4-based Inner Calorimeter for the Electron-Ion Collider RICHARD TROTTA, TANJA HORN, ANDRES VARGAS, MARCO CARMIGNOTTO, SALINA ALI, RISHABH UNIYAL, The Catholic University of America — One of the main goals of the Electron-Ion Collider (EIC) is the three-dimensional imaging of nucleon and nuclei and unveiling the role of orbital angular motion of sea quarks and gluons in forming the nucleon spin. These studies are made possible through a new framework developed to explore nucleon structure through the Generalized Parton Distributions (GPDs) and the Transverse Momentum-Dependent parton distributions (TMDs). To carry out the scientific program, a specialized detector is needed. The particle identification requirements are driven by semi-inclusive and exclusive scattering processes like DVCS. For the latter an elimination or reduction of background events is mandatory. This requires good resolution in angle to distinguish between clusters, good energy resolution for measurements of the cluster energy, and the ability to withstand radiation. The small Moliere radius of the PbWO4 crystals makes them an ideal solution for the EIC inner crystal calorimeter. In this talk we will discuss what needs to be done to build a PbWO4-based inner calorimeter, the importance of PbWO4 quality, and results from ongoing crystal characterization efforts.

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