Abstract Submitted
for the DNP20 Meeting of
The American Physical Society

The Transparent Nucleus: Unperturbed inverse kinematics nucleon knockout measurements with a 48 GeV/c carbon beam JULIAN KAHLBOW, Massachusetts Institute of Technology MIT, Tel-Aviv University — Measuring ground-state distributions of nucleons in atomic nuclei is a formidable challenge in nuclear physics, often met by particle knockout reactions. In this talk I present results from a new fully exclusive proton-knockout measurement in inverse kinematics at high energy that overcomes limitations posed by initial and final state interactions (ISI/FSI). The experiment was carried out at the JINR (Russia), where a ^{12}C beam at 48 GeV/c impinged on a liquid hydrogen target, the reaction products were measured with the BM@N detector setup, using in particular a proton spectrometer and charged particle tracking system. By missing momentum reconstruction, quasielastic pp scattering at large angles is identified, while the selection of the heavy fragment suppresses FSI. It is shown that this kind of $^{12}\mathrm{C}(p,2p)^{11}\mathrm{B}$ reaction probes single nucleon properties in a single-step knockout reaction, being in agreement with theoretical calculations. We probe Short-Range Correlations (SRC) in the same way by the break up of SRC pairs in $^{12}\mathrm{C}(p,2pN)^{10}\mathrm{B}/^{10}\mathrm{Be}$ reactions. We not only identify SRCs in such kinematical conditions for the first time but also deduce factorization and other pair properties from direct measurements.

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Date submitted: 24 Jun 2020 Electronic form version 1.4