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Towards the Study of Short Range Correlations in Radioactive Nuclei: The transparent nucleus in inverse kinematics

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Understanding the structure of a strongly-interacting quantum mechanical system such as atomic nuclei is a formidable challenge in physics. Nucleon knockout reactions with high energy probes are widely used to reveal the inner structure of nuclei, however they cannot be applied to study unstable nuclei. We recently demonstrated the feasibility to access Short-Range Correlation (SRC) properties in nuclei with hadronic probes in inverse kinematics, opening the pathway for such studies in short-lived nuclei at upcoming accelerator facilities. The experiment was carried out at the JINR (Russia), a ^{12}C beam at 48 GeV/c impinged on a liquid hydrogen target and the reaction products were measured kinematically complete with the BM@N detector setup. We show that by selecting the fragment in the $^{12}\mathrm{C}(p,2p)^{11}\mathrm{B}$ reaction limitations posed by final-state interactions are overcome and single nucleon properties are probed in a single-step knockout reaction. The extracted ground-state distributions are in agreement with theoretical calculations. We probe SRCs 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. I will in particular discuss the recent results and the future experimental program towards the study of SRCs in radioactive nuclei.