

Short-Range Correlations from Hadron-Induced Reactions

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Reactions at beam momenta and momentum transfers of several GeV/c can probe nuclei on a size scale where nucleon-nucleon short-range correlations (SRCs) are dominant. I will report on measurements of the $^{12}\text{C}(p,2p+n)$ reaction at Brookhaven National Laboratory at beam momenta of 6 to 9 GeV/c. For that experiment, the primary reaction is quasi-elastic knockout of a proton from a SRC p-n pair, followed by emission of the correlated neutron partner. For neutron momenta $\geq k_F$, the reconstructed momentum of the knocked-out proton, and the measured momentum of the detected neutron partner are nearly back-to-back in the laboratory frame of reference, which is a strong kinematic signature of SRCs[1]. After correction for neutron-detection efficiency, solid angle coverage, and absorption of the incoming and outgoing nucleons, we found that $92 \pm 18\%$ of nuclear protons with momenta ≥ 275 MeV/c had correlated neutron partners[2].

[1] A. Tang et al., Phys. Rev. Lett. **90** 042301 (2003).

[2] E. Piassetzky et al., Phys. Rev. Lett. **97** 162504 (2006).