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Nuclear Breakup of ^{17}Ne and its Two-Proton Halo Structure

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^{17}Ne is a proton-dripline nucleus that has raised interest in nuclear structure physics in recent years. As a $(^{15}\text{O}+2\text{p})$ Borromean 3-body system, it is often considered to be a 2-proton-halo nucleus, yet lacking concluding experimental quantification of its structure. We have studied breakup reactions of 500 AMeV ^{17}Ne secondary beams in inverse kinematics using the R3B-LAND setup at GSI. The foci were on $(\text{p},2\text{p})$ quasi-free scattering on a CH_2 target, and on one-proton knockout reactions on a carbon target. Recoil protons have been detected with Si-Strip detectors and a surrounding 4π NaI spectrometer. Furthermore, projectile-like forward protons after one-proton knockout from ^{17}Ne have been measured in coincidence with the ^{15}O residual core. The resulting relative-energy spectrum of the unbound ^{16}F , as well as proton-removal cross sections with CH_2 and C targets, and the transverse-momentum distributions of the residual fragments will be presented. Conclusions on the ground-state structure of ^{17}Ne will be discussed.

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