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The ratio technique: a new way to study exotic nuclei PIERRE CAPEL, Helmholtz-Insitut Mainz, RON JOHNSON, University of Surrey, FILOMENA NUNES, Michigan State University — The study of exotic nuclear structures, like halo nuclei, is usually performed through indirect techniques, such as reactions. Unfortunately, the complexity of the reaction mechanism renders the analysis of measurements more difficult than initially thought. Here, we present a new way to extract information about the structure of halo nuclei through reactions. The basic idea of this new technique is to perform the ratio of angular distributions for breakup and scattering. The recoil excitation and breakup (REB) model [1] predicts this observable to be independent of the projectile-target interaction, and hence to reveal detailed information on the structure of these nuclei. We have checked the validity of this approach within the dynamical eikonal approximation [2]. Our calculations show this ratio to be fairly independent of the reaction mechanism and thus to provide a unique way to measure halo wave functions.

[1] R. Johnson, J. Al-Khalili, and J. Tostevin, Phys. Rev. Lett. 79, 2771 (1997)

[2] D. Baye, P. Capel, and G. Goldstein, Phys. Rev. Lett. 95, 082502 (2005)

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