Abstract for an Invited Paper for the HAW09 Meeting of The American Physical Society

Overview of reaction theories to probe exotic nuclear structure IAN THOMPSON, Lawrence Livermore National Laboratory

Reactions are the key connection between nuclear structure and experiments. Determining the detailed structure of short-lived exotic nuclei is best done by an accurate application of reaction theory. Only with a good reaction theory can we probe the spectroscopic properties of those nuclei. Collective and single-particle reactions have traditionally been first analyzed by one-step DWBA methods. Such simple methods allow spectroscopic information to be extracted as the ration between experimental cross sections and unit theoretical predictions. However, especially when studying states close to threshold, it is vital to calculate couplings to the continuum, as well as other higher-order contributions. I therefore discuss modern methods that include a discretized continuum, as well as dynamic core excitations. There is now no longer a simple ratio between spectroscopic nuclear properties and observed cross sections, but more accurate and realistic measurements are thereby obtained. Prepared by LLNL under Contract DE-AC52-07NA27344.