SES08-2008-000048

Abstract for an Invited Paper
for the SES08 Meeting of
the American Physical Society

Spectroscopy of light exotic nuclei in resonance reactions[1]

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Light exotic nuclei is an important arena where predictions of modern ab initio theories can be tested. Unfortunately, experimental information on the structure of many light exotic isotopes is very incomplete due to experimental difficulties. With Radioactive Nuclear Beams, however, one can use simple resonance reactions to probe the structure of exotic nuclei. The advantage of this approach is mainly related to the fact that resonance reactions have high cross section and provide direct way to extract spectroscopic information. Recent experimental advances in the spectroscopy of light exotic nuclei using resonance reactions will be discussed. More specifically the following nuclei will be considered: ^{8}B was studied in an elastic and inelastic scattering of protons on ^{7}Be, T=3/2 isobaric chain of A=9 nuclei was studied using the ^{1}H(^{8}B,p) and ^{1}H(^{8}Li,p) reactions, populating resonances in ^{9}C and T=3/2 states in ^{9}Be respectively. Similar studies were performed for T=3/2, A=13 isobaric chain, where states in ^{13}O and T=3/2 resonances in ^{13}C were populated using ^{1}H(^{12}N,p) and ^{1}H(^{12}B,p) reactions. Level structure of these exotic nuclear systems will be discussed and compared to theoretical predictions. Experimental difficulties and possible ways to resolve them will be considered.

[1]This work is supported by NSF under grants PHY04-57120, PHY04-56463, PHY06-52591.