

RECENT ADVANCES IN STUDIES OF EXOTIC NUCLEI VIA RESONANCE REACTIONS

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Studies of exotic nuclei represent the new frontiers in understanding the quantum many-body systems. Exotic nuclei provide a new testing ground for modern nuclear theories. Recent development of experimental techniques and achievements in production of Rare Isotope Beams provides a unique opportunity to study these exotic nuclear systems. Resonance reactions, such as resonance elastic proton scattering and resonance (p,n) process, are powerful tools for the spectroscopy studies of light exotic nuclei (see Refs. [1,2,3,4,5]).

In this contribution, we will discuss recent results obtained for proton- and neutron-rich nuclei in resonance reaction studies. More specifically, spectroscopy of low lying states in ¹⁵F [3], populated in ¹⁴O+p elastic scattering will be reported. Preliminary results for the spectroscopy of exotic proton rich isotopes ⁹C and ¹⁹Na will be discussed. Application of the resonance reaction technique for studies of neutron rich isotopes will be discussed in the neutron rich heavy helium isotopes ⁷He [5] and ⁹He [4] studied through the isobaric analog states in ⁷Li and ⁹Li respectively.

[1] L.Axelsson et al., Phys. Rev. C54, R1511 (1996).

[2] G.V. Rogachev et al., Phys. Rev. C64, 061601(R) (2001).

[3] V.Z. Goldberg et al., Phys. Rev. C69, 031302(R) (2004).

[4] G.V. Rogachev et al., Phys. Rev. C67, 041603(R) (2003).

[5] G.V. Rogachev et al., Submitted to Phys. Rev. Lett.