Journey towards the drip-line of atomic nuclei

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Introduction

Discoveries of new phenomena and properties of nuclei around the limits of their existence have created Renaissance of Nuclear Physics in the present century. Some of those observed features are disappearance of traditional magic shell gaps [1-4], appearance of new magic numbers [5], new excitation modes [6], exotic shapes [7], cluster structure [8,9], unusual decay processes [10-12], etc.

These observation opens up new window for a comprehensive understanding of strong interaction and weak interaction of atomic nuclei.

I shall highlight some of those properties, studied using both stable and radioactive beam national and international accelerator facilities.

Measuring E1 dipole strength of neutron -rich nuclei, a number of static and dynamic properties of nuclei have been explored. Some of those exciting results will be presented.

Some of the above-mentioned facts, observed in atomic nuclei have significant impact in understanding, the nucleosynthesis processes [13], death of the stars, properties of densest object; neutron star [14,15] etc.

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