Contribution ID: **84** Type: **Oral**

Exotic radioactivity and decays studied by tracking technique

Thursday, 3 September 2015 14:45 (15 minutes)

The isotopes within the limiting lines of bound nuclei (or drip-lines) are goals of exploration for as many elements as possible. However the drip-line is not the end of the nuclear existence, and nuclei beyond the proton and neutron drip-lines may live much longer than the characteristic time of an orbital motion of nucleons in nuclei. These nuclei called resonances have lifetimes determined by the centrifugal and Coulomb barriers and also are strongly affected by pair nucleon correlations. Nuclear resonances can be studied by their decays via emission of proton(s) or neutron(s), or proton or neutron radioactivity, respectively. Outside the proton drip-line, proton radioactivity prevails and some isotopes with two-proton decays have been observed. They allow studying two-proton correlations in nuclei. Four-proton decay is also expected in some very exotic proton-rich nuclei. The new experimental results on two-proton decays of 19Mg and previously unobserved 30Ar, 29Ar isotopes will be presented. Their decays in-flight have been studied by using tracking technique which allows for measurements of lifetime and decay energy. Also neutron radioactivity will be reviewed. Theoretical predictions of this still unobserved phenomenon, the recent experimental activity and plans will be presented. In particular, the case of two-neutron decay of 26O will be considered in detail. Prospective candidates for observation of neutron radioactivity and the related experimental methods and detectors will be discussed.

Primary author: MUKHA, Ivan (GSI, Darmstadt)

Presenter: MUKHA, Ivan (GSI, Darmstadt)

Session Classification: General, Miscellaneous