

Mass measurements of short-lived nuclei at HIRFL-CSR

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With the commissioning of a newly-built Cooler Storage Ring (CSR) in the Institute of Modern Physics (IMP), Lanzhou in 2007, four campaigns of mass measurements for short-lived nuclei have been conducted using an isochronous mass spectrometry (IMS) technique. The radioactive nuclei were produced by projectile fragmentation and injected into the experimental storage ring CSRe. Revolution times of the ions stored in the CSRe were measured from which and masses of ⁷⁸Kr[1], ⁵⁸Ni[2], ⁸⁶Kr and ¹¹²Sn fragments have been measured. Typical resolving power of ~180000 has been achieved in the experiments. The experimental results will be presented and their impact on nucleosynthesis in the rp process and nuclear structure will be discussed.

[1] X.L.Tu et al., Phys.Rev.Lett. 106, 112501 (2011);

[2] Y.H.Zhang et al., Phys.Rev.Lett. 109, 102501 (2012).