Contribution ID: **13** Type: **Accepted**

Experiments with stored highly-charged ions at ISOLDE: TSR@HIE-ISOLDE proposal

Experiments with exotic nuclei stored in a ring have shown a huge potential in the last years. Such experiments profit from high revolution frequencies of stored beams which allows to 'recycle' the exotic nuclei and from low background conditions. New experimental ideas have been proposed in addition to the well-established scientific programs on mass and half-life measurements [1]. For example, a feasibility study has been performed at the ESR of GSI where the rate of the proton induced reaction 96Ru(p,gamma)97Rh has been successfully measured in the Gamow window of the the astrophysical p-process [2]. New proposals for the ring facilities (ESR at GSI, Darmstadt and CSRe at IMP, Lanzhou) include measurements of (p,gamma) and (alpha,gamma) reactions at low energis. Other examples are the reaction studies with internal gas-jet target [3] or di-electronic recombination measurements in exotic nuclei for radii determination [4].

We propose to store HIE-ISOLDE beams in a storage ring and to perform nuclear and atomic physics experiments. A well-suited storage ring facility is the Test Storage Ring (TSR) in Heidelberg which operation will be stalled in 2013. A dedicated workshop will be held in October 2010 where the scientific program of TSR @ HIE-ISOLDE and its feasibility will be discussed.

In this contribution we propose the idea and summarize the results of the workshop.

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