NUSTAR Seminar

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Wednesday, Dec. 02, 2020 at 04:00 p.m.

Zoom-Meeting Room

https://gsi-fair.zoom.us/j/92378610161
Meeting-ID: 923 7861 0161
Kenncode: NUSTAR

“Decay study of trans-Actinide isotopes and mass measurement project at SHANS”

Alpha decay plays a crucial role in the identification of new superheavy elements and investigation on nuclear structure of exotic nuclei near the proton drip line. Since the commission of the gas-filled recoil separator SHANS (Spectrometer for Heavy Atom and Nuclear Structure) in IMP, CAS in 2008, a series of experiments have been performed aimed at the alpha-decay studies in the region of the heaviest N=126 isotones with 89<=Z<=93 and several new isotopes have been produced allowing us for the first time to establish the alpha-decay systematics around the N=126 shell for the Np isotopic chain.

To extend the scientific program, a project aiming at mass measurement and fine particle spectroscopy has been proposed and is being commissioning. This new mass spectrometer consists of a cryogenic gas catcher, a quadrupole ion beam guide, two radiofrequency quadrupole cooler and buncher, and a multi-reflection time-of-flight (MRTOF) mass analyzer. The mechanic design of the whole setup has been finished and now the machining is ongoing. For the mass analyzer, a different geometry has been proposed, designed, and optimized by using our own coded program combining with SIMION.

In this talk, the status of the SHANS and the recently measured data on the Np isotopes will be summarized. The status of mass measurement project, and the design details and recent progress on the MRTOF mass analyzer will be presented. The prospect on the HIAF (High Intensity heavy-ion Accelerator Facility) will also be mentioned.

Convener: Timo Dickel
Secretary: R. Krause / D.Press
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