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Multi-Step Resonant Photoionization of Sn by High-Repetition-Rate Ti:Sapphire Lasers

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RAON is a heavy ion accelerator being built in Korea. It will have both the Isotope Separator On-Line (ISOL) and the In-flight Fragmentation (IF) facilities. For efficient and Z-selective ionization, the resonance ionization laser ion source (RILIS) will be included in the RAON ISOL facility. Recently, we have installed the laser system, composed of all solid state Ti:sapphire lasers developed at Mainz University and an high power Nd:YAG laser supplied by Lee Laser. Three Ti:sapphire lasers are pumped by a 10 kHz, 100 W, Q-switched, frequency doubled, diode pumped, Nd:YAG laser. Infrared beams in the 700-950 nm range are emitted by Ti:Sapphire lasers, and ultraviolet beams can be generated in the frequency doubling and tripling units. We carried out the multi-step resonant photoionization experiments with stable Sn atoms. Thermally generated Sn atoms were resonantly ionized by laser pulses in a reference atomic beam chamber designed by the LARISSA group at Mainz University. In this presentation, preliminary results of the resonant photoionization spectroscopy with stable Sn atoms and current status of the laser ion source development for RAON will be presented.

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