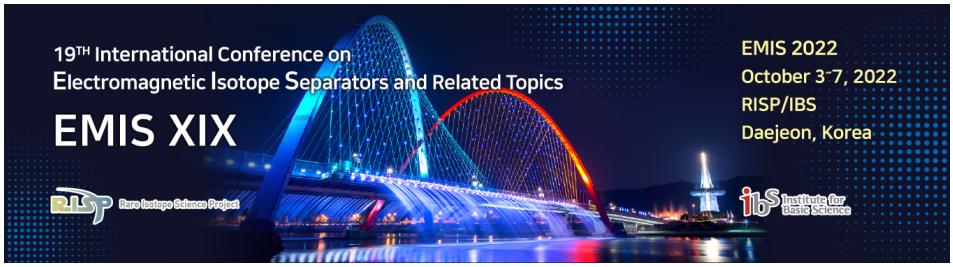

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Proof of Principle of Newly Installed Second Arm at VAMOS++ Spectrometer

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The region below doubly magic 208Pb in the nuclear chart is important to understand nuclear interactions, nuclear shell evolution, and nuclear-astrophysical r-process. However, this region remains "a blank spot"in the nuclear chart due to the difficulties of producing them using conventional reactions such as fission or fragmentation.

We used multi-nucleon transfer reactions of 136Xe (7MeV/u) beam on 198Pt target to access this region. The experiment was carried out at GANIL. The VAMOS++ spectrometer [1] was used to detect and identify the projectile-like fragments (PLFs) at a grazing (40°) angle. Complementary target-like fragments (TLFs) velocity was measured by a newly constructed second arm, composed of a vacuum chamber and multi-wire proportional counter, which was installed at the 55° angle. The prompt and delayed gamma rays from nuclei of interest were measured by AGATA HPGe tracking array with 34 crystals [2] placed around the target position and 4 EXOGAM HPGe clover detectors [3] placed at the end of the second arm, respectively.

The second arm is essential for this experiment since the nuclides of interest are on the TLFs. The particle identification through the VAMOS++ spectrometer is only possible for the PLFs, thus, the TLFs are identified indirectly. By referring to the complementary PLFs identified by VAMOS, the information of TLFs measured by the second arm is used for indirect information to help to determine TLF identification. In this presentation, 1) the development process of the second arm, such as the GEANT4 simulation result, as well as the proof of principle result of the second arm from the experimental data, namely 2) detection of isomeric states from TLFs and 3) indirect TLF determination using coincidence VAMOS and the second arm will be discussed.

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