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Status of the Super Separator Spectrometer (S3)

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The Super Separator Spectrometer (S3) facility is developed in the framework of the SPIRAL2 project. S3 has been designed to extend the capability of the facility to perform experiments with extremely low cross sections, taking advantage of the very high intensity stable beams of the superconducting linear accelerator of SPIRAL2.

The main areas of research fit into three broad categories:

- 1) Super-Heavy Elements (SHE) synthesis, $Z > 104$, and very heavy elements (VHE) produced by fusion-evaporation reactions, in order to perform their spectroscopy or ground state properties and isomeric state studies. Detailed decay spectroscopy studies and high precision mass measurements could be possible depending on the production rate.
- 2) Production and spectroscopy of neutron deficient nuclei close to the proton drip-line. Neutron deficient and $N=Z$ nuclei will be produced by fusion-evaporation reactions for various studies, for example, single particle structure, collectivity effects, shape coexistence or ground state properties.

The common feature of this ambitious research program is the requirement to separate very rare events from intense backgrounds. The development of S3 required the solution of three major technological challenges: the need for very intense heavy ion-beams to access very low cross section reactions (picobarn), the need for a powerful recoil separator with high mass resolution to ensure the selection of the ions of interest, large transmission capabilities, and the need for high efficiency detection systems to select and study the nuclei of interest.

This contribution will present the latest updates of the S3 construction and commissioning.

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