

Status of the SIRIUS detector array *

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The superconducting LINAC (LINear ACcelerator) of SPIRAL2-GANIL will deliver very intense heavy-ion beams up to uranium by virtue of the additional NEWGAIN (NEW GAnil Injector) with mass to charge ratio ($A/Q = 7$) [1]. The S³ (Super Separator Spectrometer) of SPIRAL2 was designed to have high transmission, high beam rejection and high mass resolving power capabilities to study rare isotopes like superheavy and exotic nuclei far from the stability with very low production cross-sections [2]. At the focal plane of S³, a state-of-art detector array called SIRIUS (Spectroscopy and Identification of Rare Isotopes Using S3) [3] will be installed to perform decay spectroscopic studies in the region of the very heavy and superheavy nuclei where very little spectroscopic data [4] is available. SIRIUS will be capable of detecting heavy ions and their subsequent decay products : alpha particles, beta particles, internal-conversion electrons, gamma rays, X rays and fission fragments. It is composed of an ion tracker to track the ERs (Evaporation Residues) passing through it and also to measure their time of flights, a DSSD (Double-Sided-Silicon-Strip Detector) for implanting the ERs and to establish their spatial and temporal correlations with their successive decays, four strip pad silicon detectors in a tunnel configuration placed upstream to the DSSD to detect the escaping charged particles from the DSSD thus allowing performance of internal-conversion-electron spectroscopy, five clover detectors placed in a close geometry around the silicon detectors to carry out detailed gamma spectroscopy. The setup was brought to GANIL in March 2021 and is in the commissioning phase now. In this conference, I will present the current status of the SIRIUS project.

References

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