



Contribution ID: 1624 Contribution code: THPA043

Type: **Poster Presentation**

Superconducting multipole triplet field measurements

Thursday, 11 May 2023 16:30 (2 hours)

The Super Separator Spectrometer (S3) is an experimental device dedicated to fundamental research in nuclear physics at GANIL laboratory in Caen, France. *S3 spectrometer was designed in the framework of SPIRAL2 in order to take full advantage of the very high intensity stable ion beam delivered by the superconducting linear accelerator, LINAC.*

In November 2022, the first beam of Argon beam has been accelerated to an energy of 7 MeV/u by the LINAC, opening the door for S3 experimental program. In the meantime, the installation of the spectrometer is being finalized and is due to accept the first beams by the end of 2024, for commissioning.

*In order to achieve a mass resolution of 1/450 together with a high transmission, the superconducting magnets of S3 are designed with a large warm-bore aperture of 30 cm combined with a relatively high-gradient field. The technique*** used in these Superconducting Multipole Triplets (SMT) coils aims to generate a very precise multipole fields, able to correct 2nd and 3rd order aberrations. We believe that this technique is applied, at this scale, for the first time in a heavy ion spectrometer of the nuclear physics domain.*

Detailed information of the progress of the qualification of the magnets and associated equipment, as well as the concept of the S3 spectrometer design will be presented.

Funding Agency

Footnotes

*F. Déchery et al., "Toward the drip lines and the superheavy island of stability with the Super Separator Spectrometer S3," Eur. Phys. J. A, vol. 51, no. 6, p. 66, Jun. 2015, doi: 10.1140/epja/i2015-15066-3.A. Drouart et al., "The Super Separator Spectrometer (S3) for SPIRAL2 stable beams," Nuclear Physics A, vol. 834, no. 1-4, pp. 747c-750c, Mar. 2010, doi: 10.1016/j.nuclphysa.2010.01.135.**P. L. Walstrom, "Soft-edged magnet models for higher-order beam-optics map codes," 2004.*

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Yes

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Session Classification: Thursday Poster Session

Track Classification: MC6: Beam Instrumentation, Controls, Feedback and Operational Aspects:
MC6.T17: Alignment and Survey