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Beams production optimisation on ECR4/4M ion sources at GANIL cyclotrons facility

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The GANIL (Grand Accélérateur National d'Ions Lourds) in Caen has been producing and accelerating stable and radioactive ion beams for nuclear physics, atomic physics, radiobiology and materials irradiation since 1982.

Since 2019, the beam time available on the cyclotron accelerators has been reduced in favour of the commissioning of the SPIRAL2 linear accelerator. This LINAC already delivers proton and deuteron beams for neutron physics and a second step was taken in 2024 with the acceleration and delivery of heavy ion beam to the S3 (Super Spectrometer Separator) facility.

The next objective is to increase the beam times in both facilities to meet the demand from physicists. This is accompanied by a renovation program aimed at increasing the availability of cyclotron accelerators. With this in mind, a number of studies have been carried out over the last two years on the ECR4/4M ion sources feeding the cyclotrons. The aims were to identify ways of optimising the sources to produce more stable beams with higher intensities, but also to reduce the on-call work for the ion source experts, who will have to operate up to four ECR ion sources in parallel.

In 2025, the first optimisations have been implemented online and the first results will be presented.

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