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Latest improvements of the SPIRAL1 facility at GANIL

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Since 2001, the SPIRAL1 facility has been providing post-accelerated radioactive beam by the ISOL method. Over the last decade, SPIRAL1 has been improved to provide beams of condensable elements, by using a combination of a FEBIAD-type ion source (to produce $1+$ ions) and a PHOENIX ECR charge breeder (to transform $1+$ ions into $N+$ ions for post-acceleration).

The FEBIAD ion source has undergone several minor design changes over the years in order to increase its efficiency and reliability over week-long experimental campaigns. The latest design of our Target Ion Source System (TISS) has achieved argon ionization efficiencies up to 25% and has been able to sustain 15% efficiency for 8 continuous days with excellent stability.

Progress has also been made on the SPIRAL1 charge breeder (SP1CB), which has been fitted with a second HF amplifier. This new TWT amplifier can be used alone (variable single frequency heating) or in combination with a Klystron amplifier (double frequency heating) to help us control the charge-state distribution at the exit of the SP1CB and therefore the range of energy and intensity available after post-acceleration with the CIME cyclotron.

Recent results regarding these improvements will be presented.

Primary authors: Dr CHAUVEAU, Pierre (GANIL); BOSQUET, Vincent (Ganil); DAMOY, Samuel (GANIL); DE-LAHAYE, Pierre (GANIL); DUBOIS, Mickaël (GANIL); JARDIN, Pascal (GANIL); LALANDE, Mathieu (GANIL); Dr MAUNOURY, Laurent (GANIL); THOMAS, Jean-Charles (GANIL Caen)

Presenter: Dr CHAUVEAU, Pierre (GANIL)

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