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Metal Evaporation Study Using the GANIL High Temperature Oven for Intense Metal Ion Beams Production

A new resistive oven dedicated to the production of metal ion beams using ECR ion sources has been developed at GANIL [1]. It aims to produce beams such as $^{58}\text{Ni}q+$, $^{50}\text{Ti}q+$, $^{50}\text{V}q+$ or $^{238}\text{U}q+$ with ECR4 ion source on cyclotrons injectors and with Phoenix V3 ion source on Spiral 2 facility. Typical intensity about 1.2×10^{13} pps is requested for the Super Separator Spectrometer (S3). Evaporated atom fluxes and their angular distributions have been measured on a dedicated test bench thanks to a quartz microbalance. These investigations were carried out using three crucibles with various exit caps geometries for which the fluxes and angular distributions display distinct behaviors. Based on those results crucible will be designed to obtain a high flux of atoms while minimizing the losses of atoms on the ion source chamber. Experimental results and crucible designs will be discussed.

[1] O. Bajeat et al., A new resistive high temperature oven for metallic beams production. (ECRIS'20 conference)

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