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Status of the SPIRAL2 injector commissioning

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At the “Grand Accélérateur d’Ions Lourds” (GANIL - Caen, France), the SPIRAL2 project, dedicated to stable and radioactive ion beam production, is based on a 40 MeV continuous working linear accelerator (LINAC). The accelerator is currently under installation in its tunnel. The LINAC injector is composed of two low energy beam lines transport (LEBT): one is dedicated to the light ion beam production, the other to the heavy ions. The light ion source is a permanent magnet 2.45 GHz electron cyclotron resonance (ECR) source developed at CEA Saclay to produce and inject the requested 5 mA deuteron beam into the radio frequency quadrupole (RFQ) preceding the LINAC. This source is based on the SILHI design which has demonstrated a great reliability. The first light ion beam has been successfully produced in December 2014. This important result is presented. The heavy ion source installed on the other LEBT is PHOENIX V2, an 18 GHz room temperature ECR source delivered by the LPSC. The RFQ chosen for the project can accommodate incoming ions with a charge over mass ratio higher or equal to 1/3 and a $\beta \sim 2.10^{-4}$. A status of the SPIRAL2 injector commissioning is given. PHOENIX V2 has been tested during 2 years at LPSC and the first beam of the heavy ion source, under preparation, is expected during the summer 2015. An upgrade of the PHOENIX V2 source, named PHOENIX V3, has been designed during the “Cluster of Research Infrastructures for Synergies in Physics” European project [1]. This new source is aimed to replace the PHOENIX V2 after the commissioning of the accelerator, in order to increase the beam intensities of ions up to the mass 50 approximately. The design of the PHOENIX V3 source is shown. The source is under assembly at LPSC and its first beam, expected during the summer 2015, should also be reported.

References

[1] EU Grant Agreement 283745