

HIGH INTENSITY HELIUM BEAM AT CEA/SACLAY

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Abstract

The Spiral 2 injector will be first built, installed and tested at CEA Saclay before its transfer to Caen. The RFQ has been designed to accelerate different particles: protons, deuterons and $q/A = 1/3$ heavy ions. The A-Phoenix ion source developed and tested at LPSC Grenoble will be directly transferred to Ganil. So to test the $q/A = 1/3$ ions acceleration with the RFQ built at Saclay, the light ion ECR source has been thought capable to produce 3He^+ ions. Moreover, high intensity 3He ion beam accelerator applications are possible in other domains such as astrophysics or neutrino factory. The SILHI source has been fed with natural helium (4He) gas for several hours. Beam intensity as high as 20 mA (870 Am-2 through 4.8 mm diameter aperture) has been extracted from the source with 85 keV energy. Extensive experiments will be done with the 9 mm diameter nominal plasma electrode to characterize the He^+ extracted beam. With the same extracted beam density, total beam intensity in the range of 100 mA seems reachable. In addition, simulations of the beam extraction will be done to estimate possible electrode modifications in order to improve the beam transport.

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