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Design and First Operations of a ECR Based He^- Source at INFN-LNS

A new source for the TANDEM accelerator of LNS has been designed and installed. It is called NESTOR (Noble Elements Source for acceleraTORS) and consists of an ultra-compact ECR ion source operating at about 6 GHz, up to 40 W of RF power provided by a solid state power amplifier, coupled to a Li-Charge Exchange Cell (Li-CEC). It is engineered for the production of a wide range of 1^+ and/or 1^- ion beams from gaseous elements, in particular for noble gases. This work presents the characterization of the primary source and first operations of the whole setup on the HV platform (injector) of the Tandem. The He^+ beams have been formerly characterized in terms of current, beam shape (by BaF_2 beam viewers) and emittance (by the three-gradients method). Measurements have been carried out varying pressure, microwave frequency and RF power. Then, the source has been moved to the HV platform, coupled to the Li-CEC for first operations running in gas-exchange mode. Activities are ongoing to optimize beam transport towards the Tandem.

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