

**The new ECR charge breeder for the selective production of exotic species
project at INFN - Laboratori Nazionali di Legnaro**

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The Selective Production of Exotic Species (SPES) project is an ISOL facility under construction at Istituto Nazionale di Fisica Nucleare - Laboratori Nazionali di Legnaro (INFN-LNL). 1+ radioactive ions, produced and extracted from the Target-Ion-Source system, will be charge bred to high charge states by an ECR charge breeder (SPES-CB): the project will adopt an upgraded version of the PHOENIX charge breeder, developed since about twenty years by the Laboratoire de Physique et de Cosmologie (LPSC). The collaboration between LNL and LPSC started in 2010 with charge breeding experiments performed on the LPSC test bench and led, in June 2014, to the signature of a Research Collaboration Agreement for the delivery of a complete charge breeder and ancillaries, satisfying the SPES requirements. Important technological aspects were tackled during the construction phase, as for example beam purity issues, electrodes alignment and vacuum sealing. This phase was completed in spring 2015, after which the qualification tests were carried out at LPSC on the 1+/n+ test stand. This paper describes the characteristics of the SPES-CB, with particular emphasis on the results obtained during the qualification tests: charge breeding of Ar, Xe, Rb and Cs satisfied the SPES requirements for different intensities of the injected 1+ beam, showing very good performances, some of which are "best ever" for this device. The SPES beam lines have been modified since the original design, details about these modifications will also be reported.