

## A Test Stand for Ion Sources under Ultimate Reliability

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The rationale behind the ITUR project (Basque word for “source”) is to perform a comparison between the different kinds of H<sup>-</sup> ion sources using the same beam diagnostics setup. In particular, a direct comparison will be made in terms of the emittance characteristics of Penning Type sources such as those currently in use in the injector for the ISIS (UK) Pulsed Neutron Source and those of volumetric type such as that driving the injector for the ORNL Spallation Neutron Source (TN, U.S.A.). The endeavour here pursued is thus to build an Ion Source Test Stand where virtually any type of source can be tested and its features measured and, thus compared to the results of other sources under the same gauge. It would be possible then to establish a common ground for effectively comparing different ion sources. The long term objectives are thus to contribute towards the building of minimum emittance, maximum performance, high reliability-availability, high percentage of desired particle production, stability and high brightness compact sources.

The first phase of such a research programme which is financed through ministries of Industry and Education & Science [1] is well underway and consists on a test stand able to compare the emittance characteristics of both ECR proton and -H arc-discharge sources such as the Penning trap used at ISIS and RF driven sources such as the multicusp -H source being at present in use at SNS [2] and a caesium-free multicusp source such as that developed by DESY [3].

The project consortium is lead by Tekniker-IK4 research centre and partners are companies Elytt Energy and Jema Group. The technical viability is guaranteed by the collaboration between the project consortium and several scientific institutions, such the CSIC (Spain), University of Basque Country (Spain), ISIS (STFC-UK), SNS (ORNL-USA) and CEA in Saclay (France).

### References

- [1] ITUR 2007 - Identification Number PNE-20071027 of the Spanish Industry Ministry.
- [2] T.E. Mason and L.K. Price, Spallation Neutron Source Completion Report, June 2006, SNS 100000000-BL0005-R00
- [3] J. Peters, H.H. Sahling and I. Hansen . Review of Scientific Inst., 79, 02A523 (2008).

**Topic:** 2 - H- and D- Sources for Fusion, accelerators and other applications

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