EURISOL Design Study: Towards an Ultimate ISOL Facility for Europe

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The scientific promises of radioactive beam research have led the European nuclear physics community to propose to study and build a next generation ISOL facility called EURISOL. The baseline design is a 5 MW CW proton LINAC impinging on a liquid mercury converter preceding a fissile target. Spallation targets are also planned. Post-acceleration will be performed with a superconducting heavy-ion LINAC which is designed for 150 MeV/nucleon $^{132}$Sn for example.

Detailed engineering studies and prototype building are currently being carried out within the EURISOL Design Study[1], supported within the European Union 6th framework programme. Twenty European laboratories and institutions from fourteen countries participate in this endeavour. The work is divided into 12 tasks, covering accelerators (driver and post accelerator), high power targets, safety, beam manipulation, beam intensity calculations and physics and instrumentation. A conceptual study for a neutrino beta-beam facility making use of the beta-decay of the large quantities of radioactive nuclei produced is an integral part of the programme.

This talk will describe the baseline design of the EURISOL facility and its expected performances. Recent advances concerning in particular the driver capabilities, the post-accelerator design and the production targets will be given. The place of EURISOL in the roadmap for nuclear physics facilities in Europe in the next two decades will be discussed, in particular in relation to the “intermediate-generation” ISOL facilities - HIE-ISOLDE, SPES, and SPIRAL2 - currently planned or under construction.

[1] see http://www.eurisol.org

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