

The MYRRHA phase 1 accelerator: design status and commissioning of the first components

A. Gatera*, J. Belmans, F. Davin, W. De Cock, P. Della Faille, F. Doucet, M. Grosso Xavier, F. Pompon, A. Ponton, D. Vandeplassche, SCK•CEN (Belgian Nuclear Research Centre), Boeretang 200, BE-2400 Mol, Belgium
M. Baylac, D. Bondoux, F. Bouly, M. Debongnie, LPSC, CNRS-IN2P3/UJF/INPG, Grenoble, France
H. Podlech, K. Kümpel, Institute for Applied Physics (IAP), Goethe University Frankfurt, Frankfurt, Germany
D. Uriot, CEA Saclay/DRF/IRFU, Gif-sur-Yvette, France
C. Joly, IPNO/ IN2P3/ CNRS, Orsay, France

*angelique.gatera@sckcen.be

Abstract

The MYRRHA project at SCK•CEN is an ADS composed of a sub-critical nuclear reactor driven by a 2.4 MW linear proton accelerator (600 MeV, 4 mA CW beam). The accelerator is being designed to achieve unprecedented reliability and availability, explaining the phased approach in its installation. The first phase currently ongoing until 2026 aims at demonstrating the fault compensation strategy for the 600 MeV linac on a 100 MeV linac. The MYRRHA phase 1 accelerator will deliver a 100 MeV, 4 mA CW proton beam. A fraction of the beam will be sent to a PTF (Proton Target Facility) for various applications including ISOL, fusion research and isotope production.

The design of the 100 MeV accelerator is now validated by beam dynamics and error studies. The first components of its injector composed of an ECR (Electron Cyclotron Resonance) proton source, an LEBT (Low Energy Beam Transport line) and an RFQ (Radio Frequency Quadrupole) are currently being commissioned at the Centre de Ressources du Cyclotron (CRC) in Louvain-la-Neuve. Both the updated design and a status on the commissioning activities will be presented.

Work supported by the European Commission Framework Programme H2020, MYRTE project nr. 662186