

ACCELERATOR COLLOQUIUM

PUBLIC LECTURE

“Generation IV Advanced Nuclear Systems and Role of MYRRHA as Waste Transmutation R&D Facility”

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Nuclear fission energy is a proven technology that provides today 31% of electricity in the EU-27, with reactors in 15 countries. It is the largest source of low carbon electricity, saving nearly 900 mT of CO₂ emissions a year. It contributes to Europe's security of supply by limiting the dependence on fossil fuel imports. Building up on its present leading position, Europe has to invest in R&D to overcome technological breakthroughs that would guarantee Europe's future low Carbon energy mix and energy security of supply.

In this talk, we will report on this vision and on the innovative nuclear systems as well as the status of the MYRRHA project and their perspective and how this can lead to sustainable nuclear energy use.

“The Linear Accelerator for the MYRRHA ADS”

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Accelerator Driven Systems (ADS) are promising tools for the efficient transmutation of nuclear waste products in dedicated industrial installations, called transmuters. The MYRRHA project at Mol, Belgium, placed itself on the path towards these applications with a multipurpose and versatile system based on a liquid PbBi (LBE) cooled fast reactor (80 MWth) that may be operated in both critical and subcritical modes. In the latter case, the core is fed by spallation neutrons obtained from a 600 MeV proton beam hitting the LBE coolant/target. The accelerator providing this beam is a high intensity CW superconducting linac delivering a 4 mA beam and which will be laid out for the highest achievable reliability. The combination of parallel redundant and of fault tolerance implementing schemes should allow obtaining a beam MTBF value in excess of 250 hours that is required for optimal integrity and successful operation of the ADS. MYRRHA is expected to be operational in 2023. The forthcoming 3-year period is fully dedicated to R&D activities, and in the field of the accelerator they are strongly focused on the reliability aspects and on the proper shaping of the beam trip spectrum. The R&D effort takes advantage of the highly modular structure of the linac which allows for efficient prototyping.

**Thursday, June 14, 2012
11:00 a.m.**

CEBAF Center, Room F113

Coffee & cookies before the colloquium starting at 10:45 am