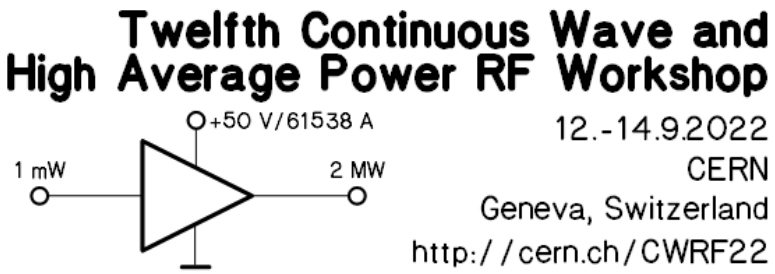

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RF SSAs for MINERVA, general architecture and main challenges

Tuesday 13 September 2022 09:20 (25 minutes)

SCK CEN (Studiecentrum voor kernenergie or Centre d'étude de l'énergie nucléaire) is building MINERVA on views of MYRRHA, an ADS (Accelerator Driving System) which will eventually enable transmutation of nuclear waste but also fundamental research.
MINERVA LINAC will accelerate a proton beam current of 4mA@100 MeV in CW. The front-end will be composed by an injector with 20 NCRF (Normal Conducting Radio Frequency) cavities operating at 176,1 MHz and a main LINAC with 60 SRF (Superconducting Radio Frequency) cavities operating at 352,2 MHz.
The NCRF and SRF cavities will be powered by using SSAs with RF power levels ranging from 6 kW up to 140 kW and from 6 to 25 kW respectively.
The extremely high reliability (MTBF > 250h) is one of the main requirements which would need to be achieved. It will be accomplished by implementing parallel redundancy in the NCRF section and an innovative fault tolerant scheme for the SRF section.
This talk presents the general RF SSAs system architecture for MINERVA as well as the main challenges for the RF SSAs due to the extremely high reliability requirements for both sections, NCRF and SRF, but also due to the fault tolerant scheme for the SRF section, which will strongly impact the operational point of the RF SSAs.

Author: Mr ILLAMOLA, Victor Martinez (SCK CEN)

Presenter: Mr ILLAMOLA, Victor Martinez (SCK CEN)

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