



Contribution ID: 1279

Type: **not specified**

## **P3.232 Radiation shielding requirements for the full power operation of the Linear IFMIF Prototype Accelerator (LIPAc) at Rokkasho**

*Wednesday, 19 September 2018 11:00 (2 hours)*

The IFMIF (International Fusion Materials Irradiation Facility) project aiming at material tests for a future fusion power plant is now in the Engineering Validation and Engineering Design Activities (EVEDA) phase under the Broader Approach Agreement between Japan and EU. As part of the activities the construction of the Linear IFMIF Prototype Accelerator (LIPAc) is in progress at Rokkasho, Japan in order to demonstrate the validity of the low energy section of an IFMIF deuteron accelerator up to 9 MeV with a beam current of 125 mA in CW. The present study is devoted to finding the configuration of the radiation shielding in the accelerator building necessary for the operation of LIPAc at the full power of 1.125 MW to satisfy the radiation dose limit prescribed by the law. The beam accelerated in LIPAc is stopped at the beam dump, and a significant amount of neutrons and photons are generated. The detailed design and various studies for the beam dump have been conducted by CIEMAT, Spain, and most of its constitutional elements have been already manufactured in Europe. QST is then responsible for the installation on site and also for the nuclear licensing required for the operation of the accelerator. The accelerator building has the characteristic that it has many penetrations for HVAC ducts, cooling water pipes, cables and coaxial waveguides to supply the RF power to the accelerator. For this reason, some additional shielding shall be carefully designed to reduce the neutron streaming effect and to satisfy the dose criteria during full power operation with consideration for its construction possibility. In the present study, the detailed shielding analysis has been performed by taking the final configuration of the building integrated with the beam dump into account and the necessary condition for the radiation shielding has been found out.

**Presenter:** KONDO, Keitaro (Department of Fusion Reactor Materials Research National Institutes for Quantum and Radiological Science and Technology (QST))

**Session Classification:** P3