

## Talk 4: IFMIF-DONES neutron irradiation facility

*Wednesday 12 June 2024 10:19 (12 minutes)*

### Abstract:

IFMIF-DONES (International Fusion Materials Irradiation Facility –DEMO Oriented Neutron Source) [1,2] is a pioneering accelerator-based neutron irradiation facility currently under construction in Granada, Spain. It is a part of the European roadmap to fusion electricity and a key laboratory to prepare for the construction of the DEMO fusion power plant.

The main mission of DONES will be to perform high dose rate irradiation of structural and functional materials using an intense neutron flux with an energy spectrum similar to that expected within fusion reactors. IFMIF-DONES will also become a multidisciplinary neutron science facility covering a wide range of applications, including, among others, tritium breeding experiments for the fusion fuel cycle, nuclear physics studies, neutron imaging, biological, medical and industrial application of neutrons.

The facilities for complementary experiments at DONES will feature a collimated neutron beam experimental area in which several irradiation stations can be arranged in a sequential configuration. The neutron flux of the order of  $10^{13} \text{ m}^{-2} \text{ s}^{-1}$  in a continuous beam mode can be used for experiments either directly or after passing through a moderator. It is also planned to implement a neutron Time-of-flight experimental area for measurements with pulsed beams of neutrons of selected energy.

In this contribution I will show the main design features, construction status and plans for neutron irradiation facilities at IFMIF-DONES. The opportunities for industrial irradiations of materials and components in a mixed neutron and gamma radiation field at DONES will be presented for discussion.

### CV:

Wojciech Królas is a professor at the Institute of Nuclear Physics of the Polish Academy of Sciences in Kraków, Poland. His area of interest covers nuclear structure, neutron physics, particle and gamma radiation detectors. Since 2015 he is part of the design team preparing the construction of the IFMIF-DONES neutron irradiation laboratory. He is responsible for the implementation of the facilities for complementary experiments and the build-up of the DONES users community.

**Presenter:** KROLAS (INSTITUTE OF NUCLEAR PHYSICS PAN), Wojciech

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