



Contribution ID: 8

Type: **Oral Presentation**

## Slowing Down of 14 MeV fusion neutrons and possible applications

*Monday, 14 October 2019 14:25 (25 minutes)*

The spectral fluence rate of the thermalized neutron field obtained by slowing down the 14 MeV fusion neutrons produced at the accelerator-driven Frascati Neutron Generator is measured by means of the Bonner Sphere Spectrometer. Neutron thermalization is achieved by means of a moderator assembly made of a copper pre-moderator and a polyethylene moderator.

A Monte Carlo simulation reproducing the experimental set-up is also performed by means of the MCNP code and the results are compared to the experimental data. The benchmarked Monte Carlo is then used to predict the brilliance of a thermal moderator operating at a potential high intensity 14 MeV neutron continuous source featuring a neutron emission rate of  $10^{15} \text{ s}^{-1}$ . The results obtained show that if a D-T neutron source featuring a continuous neutron emission rate of  $10^{15} \text{ s}^{-1}$  could be made operative, it may be exploited for neutron science.

**Primary author:** PIETROPAOLO, Antonino (ENEA Department of Fusion and Technologies for Nuclear Safety and Security)

**Co-authors:** Dr FLAMMINI, Davide (ENEA); Dr MORO, Fabio (ENEA); Dr BEDOGNI, Roberto (INFN-LNF)

**Presenter:** PIETROPAOLO, Antonino (ENEA Department of Fusion and Technologies for Nuclear Safety and Security)

**Session Classification:** Sources

**Track Classification:** Target/Moderator