Neutron diagnostics for fusion experiments

G. Bonheure[1]

JET-EFDA Culham Science Centre OX14 3DB, Abingdon, UK

1. ERM-KMS, B1000 Brussels, Belgium, Partner in the Trilateral Euregio Cluster

Fusion is preparing for and moving towards reactor scale plasma experiments. In these experiments, high fusion gain plasmas Q ~ 10 for 300-600 s are expected. The ITER project requires stepping up the capabilities of existing fusion neutron measurement systems and developing new ones. Fast neutron measurements systems for fusion applications include neutron flux measurements systems, neutron cameras composed of multi-collimator arrays and neutron spectrometers. The spectral width of the fusion neutron emission should be a reliable plasma temperature measurement in the reactor. Therefore, several types of neutron spectrometers are being developed. The different instruments, methods and calibration techniques are described. Finally, recent advances in these applications benefit substantially from progress and technological developments arising in various fields including new detectors, electronics, data acquisition and data analysis.

Corresponding author: Name: Dr. Georges Bonheure
e-mail: georges.bonheure@gmail.com
phone: +441235465099
fax: +441235464535