**The single crystal diamond-based diagnostic suite of the JET tokamak for 14 MeV neutron spectroscopy measurements in DT plasmas**

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In the recent year the EUROfusion enhancement program has allowed to significantly improve the JET nuclear diagnostics in view of the Deuterium-Tritium (DT) campaign. In particular, the set of the 14 MeV neutron spectrometers has been expanded with single crystal diamond-based detectors. A diamond matrix has been installed looking radially the plasma at a distance of about 20 m. In order to increase the counting statistics of the detector, it is made by 12 identical single crystal pixels working independently. Other two diamond spectrometers are single pixel diamond samples, both installed tangentially at 47 and 52 degrees with respect to the magnetic axis of the torus. The idea to using the same technology along different lines of sight allows for measuring the anisotropicity of the neutron emission which is a feature in case of use of external heating systems. Diamond detectors have been selected for their compactness, enhanced energy resolution (<1% at 14 MeV), very high count rate operation (up to 1 MHz) and high radiation hardness. They are prone to be installed on already existing fusion devices or where there are space limitations, such as on multi-lines of sight of neutron cameras.

In this paper, the suite of the diamond diagnostics will be described together with the electronics and data acquisition system, besides the detector response function to monenergetic neutrons. Typical example of measured 14 MeV neutron spectra collected during the DTE2 campaign will be also presented.

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