

## The new Ex-Vessel Magnetic Diagnostics System for JET

**Vincenzo Coccoresse(1)**, Giovanni Artaserse(1), Giuseppe Chitarin(2), Trevor Edlington(3), Sergei Gerasimov(3), Simone Peruzzo(2), Antonio Quercia(1), Clive Sowden(3)

1. Associazione EURATOM-ENEA(CREATE) Via Claudio 21 80125 Napoli Italy

2. Consorzio RFX - Associazione EURATOM -ENEA sulla fusione Corso Stati Uniti 4 I-35127 Padova Italy

3. Association Euratom-UKAEA, Culham Science Centre Abingdon UK

A new system of magnetic probes was installed during the 2005 shutdown and was commissioned during the 2005/06 restart phase of JET. The system has been developed in the framework of the JET enhancement project on Magnetic Diagnostics, which aims to improve the equilibrium reconstruction and the real time control in JET, by means of 98 new field measurements as well as of new software tools.

The subsystem presented in the paper includes probes located outside the vessel and it is made of 8 pickup coils, 8 Hall probes and 6 flux loops. The objective of this subsystem is twofold: i) provide experimental data for a better modelling of the iron in the axisymmetric codes for plasma equilibrium reconstruction; ii) test the reliability of direct field measurements. The new sensors are located very near to the iron structure, so to provide useful information for the online tuning of the code parameters representing the iron characteristics.

Direct field measurements from Hall probes are used to correct the drift of the integrators of the pickup coils signals. This feature will be crucial for future ITER-like devices, where long lasting flat top phases are expected, in a high neutron yield and a high temperature environment.

After a general overview of the system, the paper describes the major manufacturing and installation issues, including the construction of the supports and probes as well as the acceptance tests before and after installation.

The functional commissioning of the system, which was successfully concluded during the restart phase, is also illustrated. It includes the integration of the new signals in the JET CODAS system and the analysis of several discharges with and without plasma. The critical aspects of the assessment of the reliability of the signals are shown and commented on.