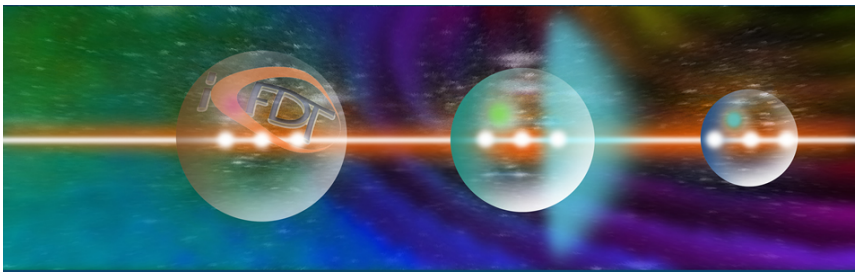

Contribution ID: **66** Type: **Talk**

Diagnostics for DTT in view of DEMO

Friday, 5 October 2018 15:00 (30 minutes)

The main mission of the Divertor Test Tokamak (DTT) is to explore viable solutions to the power exhaust issues in a fusion reactor. The ultimate goal will be to qualify and control in various divertor configurations DEMO relevant heat flux densities to the wall while preserving the integrity of both the plasma facing components and the plasma performance. Experiments will involve tailored magnetic topologies, highly radiative regimes and advanced materials.
In this contribution, we describe the package of diagnostic systems that will be deployed to allow DTT accomplishing its tasks. Diagnostics and feedback control are particularly functional to the need of maintaining the plasma close to equilibrium in situations prone to instabilities where the plasma wall interaction is optimized. Focusing on the divertor diagnostics, a particular effort will consist in obtaining space resolved measurements of density, temperature, impurity densities and ionization front that can be compared with the 2D results of model simulations. This will be possible using mainly optical diagnostics based on filtered cameras and spectrometers deployed in imaging mode, complemented by local measurements obtained by a space resolved Thomson scattering, Langmuir probes and gas puffing imaging systems. Diagnostics of the main plasma will assure a full qualification of the core and of the pedestal in terms of thermal contents, equilibrium, fast particles densities, impurities, reactivity levels and turbulence.
Strongly oriented to the exploration of control methods suitable for DEMO, DTT will also address the study of control systems based on physics and engineering models, which in DEMO are expected to take over the role of the diagnostics deemed to be incompatible with the harsh environment of a fusion reactor.

Primary author: Dr VALISA, marco (Consorzio RFX)

Co-authors: Dr TARDOCCHI, Marco (Istituto di Fisica del Plasma "Piero Caldirola",CNR); Dr TUDISCO, Onofrio (ENEA); INNOCENTE, Paolo (Consorzio RFX)

Presenter: Dr VALISA, marco (Consorzio RFX)

Session Classification: DTT (Divertor Test Tokamak)