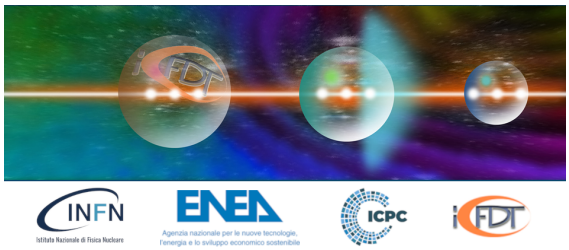

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The Integration of Diagnostics in DTT at the Conceptual Design Stage: Technological and Instrumental Challenges

Tuesday, 22 October 2024 10:00 (20 minutes)

The main goal of the Divertor Test Tokamak (DTT) facility is the investigation of viable particle and power exhaust solutions for fusion reactors [1,2]. Performances, integration of edge and core and flexibility of the configuration are the guidelines of the DTT project, in order to test various power exhaust strategies for reactor relevant confined plasmas in a compact device. In this context, the integration of a complex and comprehensive set of diagnostics has to face the challenges imposed by advanced performance plasmas, a harsh environment and severe topological constraints. Once identified the scientific and functional requirements of each system, the design and implementation of the diagnostics have also to address several interface issues, including remote handling compatibility and stray electron cyclotron radiation, and severe levels of neutron and gammas radiation, particularly dangerous for optical components and electronics. In addition, the high degree of integration between the various systems and subsystems, required in a compact device, impose the adoption of strict methodologies of functional analysis, to guarantee a proper trade-off between the sometimes conflicting needs of machine protection, plasma control and physics programme.

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