**MT29 Abstracts and Technical Program** 



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## Sat-Af-Or1-01: [Invited] ITER Magnet Cold Test Facility Design and Assembly

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ITER project has decided mid 2023, to procure a Magnet Cold Test Facility (MCTF) to test as many as possible Toroidal Field Coils (TFC) and the Poloidal Field Coil PF1, before they will be assembled in the tokamak. An important constraint is that the coil tests shall not impact the tokamak construction. The earliest readiness of the facility is then very important factor to optimize its usage for TFC.

The main objectives will be to check the coil behavior or performances (as joint resistance, mechanical deformation, operating conditions) at 4 K at full current, 68 kA for TFC and 48 kA for PF1, with a special focus on the ground insulation in Paschen condition. In addition to the coils tests, the facility will be a training facility for ITER magnet commissioning as it is foreseen to use as far as possible ITER equipments (as the cryoplant, the current leads, the quench detection systems, the control system), but also ITER commissioning and machine protection procedures. The Power Converter rated at 70 kA has been designed and procured for the facility, as well as a cryostat, 20 m long and 10 m width able to host as well a TFC or PF1. The Fast Discharge Unit (FDU), also procured on purpose, has the same design layout than the ITER FDU. The status of these procurements and of the facility assembly will be presented.

In order to support these different components design, interfacing and the test protocole, the project has carried out an exhaustive analysis plan that is including the cryostat evacuation, the cooling down at 4 K, the electromagnetic load in static and transient, the quench analysis. The main outcomes of these analysis will be presented.

The MCTB project is starting his commissioning phase, and the optimisation of the coil test sequence to support the tokamak assembly schedule. The commissioning plan will be presented as well as the main steps of the tests phases.

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