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## Thermal-mechanical analysis and design optimisations of the IFMIF-DONES HFTM

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The International Fusion Materials Irradiation Facility – DEMO-Oriented Neutron Source (IFMIF-DONES) is planned to generate a high flux of  $5E16$  neutrons/s with First Wall relevant energy spectrum. The High Flux Test Module (HFTM), is the dedicated assembly to bring the material specimens into the high flux region of the neutron source and maintain the specified irradiation conditions.

Based on neutronic analysis, the nuclear heating of the HFTM under normal operational conditions was calculated. A subsequent CFD analysis was performed to determine the temperature field of the HFTM structure. This temperature field and the internal operating pressure are the basis for the structural analysis and stress assessment of the HFTM body in regard of the requirements of the RCC-MRx code. Furthermore, design optimisations are presented especially in regard of the installation of the irradiation capsules in the HFTM during assembly. To keep installation time of HFTM in the Test Cell (TC) as short as possible, connectors are foreseen on top of the HFTM, which transmit signals and electrical power from and to the irradiation capsules. A design proposal of a quick and fail-safe HFTM-sided multi-coupling solution for these connectors is presented.

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