Thermo-structural analyses of the in-vessel components of the ITER collective Thomson scattering system - DTU Orbit (14/03/2019)

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The Collective Thomson Scattering (CTS) diagnostic system will be used at ITER to provide spatial and temporal measurements of fast ion velocity distributions. The diagnostic is based on the CTS principle, where a microwave beam scatters off electrons in the plasma. The scattered radiation is then collected and measured, providing information about the fast ions. The system components are either considered in-vessel or ex-vessel depending on their location in the port plug. In this work, thermo-structural analyses were performed on four in-vessel components using the finite-element method (FEM) and the commercial software ANSYS Mechanical v18.0. The analyses indicate that active cooling will be required for most of the analysed components. The thermal stresses will be used to perform the structural assessment of these components based on the RCC-MR code.

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