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P3.088 ITER TF coil OIS interface assembly tool

Wednesday, 19 September 2018 11:00 (2 hours)

Assembling of ITER components is a major challenge especially because of the large size and weight of its components, and the high accuracy that has to be reached. As part of the Magnets Infrastructures Facility for Iter (MIFI) agreement between CEA and IO, CEA works on the assembly sequence of ITER TF coils OIS (Outer Interface Structure) composed of shear pins and bolts. These pins and bolt weight approximately 35 kg, and are located in a small space which considerably complicates their manipulation and assembling. A specific tool was developed by the CEA design office in order to achieve the assembling of these bolts and pins. This tool, inspired by tele-manipulators, uses complex kinematics and a counterweight in order to be equilibrated in any position, allowing an operator to easily manipulate a 35 kg bolt. As the assembly sequence and the accessibility are very constrained, virtual reality simulations with contact detection was necessary to define and validate the range of each joint and the volume occupied by this tool.

First the ITER context and the assembling sequence of two ITER coils are presented. Then, the concept of the tools is explained and the methodology for its dimensioning is explained. Finally, the assembly sequence of the bolts with the tool is validated thanks to VR simulation developed under Unity.

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