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Performance of the ITER CS joints

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The US Domestic Agency (USDA) is the supplier of the Central Solenoid (CS) for ITER. The ITER CS uses three different types of joints. In order to verify the joint performance in close to the operational conditions, the USDA built a test sample that contains all three types of CS joints in order to test it in the SULTAN facility. The SULTAN facility allows testing under a variable DC magnetic field, a variable AC field, a variable temperature, and can charge the joints with currents up to 100 kA. The CS SULTAN Sample containing all three CS joints was built by the industrial vendor using their qualified manufacturing procedures. The SULTAN test program is focused on characterization of these CS joints, as well as measurements of resistance, AC loss, and temperature margins in different relevant conditions. We report the test results of all three CS joints in the SULTAN facility and compare them with the theoretical predictions and earlier results on the joints, which was obtained in the Joint Test Facility at Oak Ridge, TN during the R&D phase of the CS project.

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USA

Primary authors: MARTOVETSKY, Nicolai (ORNL); STEPANOV, Boris

Co-authors: Dr REIERSEN, Wayne (PPPL/ORNL); EVERITT, David (ORNL); SMITH, John (GA); STEPHENS, Alan (GA); POTTS, Robert (GA); BRUZZONE, Pierluigi (EPFL-CRPP)

Presenter: STEPANOV, Boris

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