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Design of CFETR TF Prototype Coil
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Abstract
China Fusion Engineering Test Reactor （hereinafter referred to as "CFETR"）, based on ITER technology and bridged between ITER and DEMO, has been supported by China government to start technologies R&D and engineering design. Superconducting coil is treated as important device for fusion reactor. The field of CFETR at plasma core is 6.5T, maximum field of TF coil is about 14.5T. TF coil is winded by high-performance Nb3Sn wires and CICC conductors. Coil weight is about 550T with height about 22m and width about 15m. Design and manufacturing technologies of TF coil need to be developed and validated. TF coil design consists of mechanical & electro-magnetic design and analysis, conductor design and analysis, coil AC loss analysis, thermal-hydraulic analysis and coil cooling, quench detection and coil protection, coil winding, case manufacture, and coil assembling. Engineering design has been carried out at ASIPP. Duration for design and manufacture will be 5 years.

Key words: CFETR, TF coil, CICC.

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