

Cooling architectures of the superconducting magnets for fusion reactors

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PhD may follow: No

Summary :

Future fusion reactors, such as the European demonstrator EU DEMO, will have superconducting magnets cooled at 4 K by forced flow supercritical helium. Pre-conceptual studies are carried out in order to size the future superconducting magnets and their cooling systems. The Low Temperature Laboratory SBT in CEA Grenoble is involved in these activities in collaboration with several research institutes in Europe, in the framework of the Eurofusion contract. It is developing a computational tool for sizing the cryo-magnetic system: Simcryogenics with the MATLAB/Simulink environment. The internship is intended to carry out simulations with this thermal hydraulic code both in steady state and unsteady state and to study the 1-D thermal hydraulic of the superconducting magnets coupled to the cryogenic system.

Requested skills :

Heat transfer, Hydraulic, thermodynamics, modelling, MTLAB/Simulink