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PhD Thesis Abstract

Tokamak Magnetic Control Simulation: Applications to JT-60SA and ISTTOK Operation

Control of the geometrical parameters of the plasma in fusion devices is crucial for a future reactor. This can be achieved by controlling the plasma current, position and shape by means of magnetic fields produced by poloidal field coils. Moreover plasma control is a major issue on the machine operation and protection and one major field where knowledge should evolve. The construction and operation of the JT-60SA tokamak is the main project currently carried out jointly by Japan and the European Union as an ITER "satellite" tokamak. This thesis project deals with some of the key technologies for JT-60SA operation and in general for fusion devices on control optimization of time response and energy demand of the power supplies. Since JT-60SA is still under construction, models and controls developed during this work will be adapted and tested on the ISTTOK Tokamak as a case study for those kind of controllers.