

# **Simulation study of fast control power supply for Tokamak fusion reactor**

## **Abstract**

Tokamak plasma suffers from several instabilities which could be restrained by active control. Instabilities results in plasma rupture. The plasma displacement energizes feedback coils which track the input reference and generate rapidly changing magnetic field and then control plasma displacement. The feedback coil is supplied by the fast control power supply (FCPS). The power level of such power supplies are quite high which results in several problems such as injection of harmonics on supply side, voltage flicker, large reactive power demand, etc. This project explores a novel topology of the power supply for fast control of the feedback coils in real time. The power supply load is mostly inductive in nature, which is a feedback coil. One of the most pivotal feature of the FCPS is its fast response of the order of less than 1 ms. The simulation is to be carried in MATLAB/PSIM software.

## **Academic Project Requirements:**

**1) Required No. of student(s) for academic project: 1**

**2) Name of course with branch/discipline: B.E./B.Tech. Electrical**

**3) Academic Project duration:**

**(a) Total academic project duration: 10 Weeks**

**(b) Student's presence at IPR for academic project work: 3 Full working Days per week**

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