

Overview of the DIII-D Internal Resistive Wall Mode Stabilization Power Supply System*

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With the recent installation in the DIII-D Tokamak of internal resistive wall mode (RWM) stabilization coils (I-Coils), upgrades to the existing RWM and error field correcting power supply systems were necessary. The new I-Coil system is comprised of 12 individual low inductance magnetic field coils that can be rearranged in multiple configurations with the main purpose of providing feedback stabilization up to the ideal wall beta limit without the need for strong plasma rotation. This paper will discuss the power supply system upgrades needed to drive up to 5 kA in these low inductance coils.

The power supply system is now comprised of (5) 300 Vdc, 5-7 kA pulse rated power supplies which can either be connected directly to magnetic coils or else provide input power to (4) 300 Vdc, 5 kA pulse rated switching power amplifiers (SPAs). The SPA actuators, when connected to the I-Coils provide maximum current from dc to 300 Hz and can operate up to 2 kHz at reduced current, limited by the inductance of the I-Coils and their cable feeds. In some experimental scenarios faster response with lower phase shift is required than can be provided by the SPAs. In this case, high power audio amplifiers will be installed. We will present the details of the upgraded power system including instrumentation, data acquisition, multiple SPAs powered by a single dc supply, a versatile patch panel, and low inductance cabling. In addition, the design of audio amplifiers will also be discussed.

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