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Active Control of Resistive Wall Modes by Saddle Coils in Keda Torus eXperiment

Keda Torus eXperiment (KTX) is a reversed field pinch (RFP) device in the University of Science and Technology of China. Resistive wall modes (RWMs) and tearing modes (TMs) of RFP configuration limit the increase of discharge duration of the device.

The article introduces the experiment and results of active control of RWMs with $m=1$, $|n|\leq 5$ by controlling the external power supply and saddle coils in KTX. An active control electronics system has been designed and implemented. The system is based on PCI extensions for instrumentation express (PXIe) chassis. Field programmable gate array (FPGA) is the central part of the whole system to control all the process, including data acquisition from the magnetic probes, high-speed data transmission and data summary processing in real time. FPGA gives feedback signals to 80 external power supplies after operations such as mode analysis to change the current of saddle control coils.

At present, the functions of the electronics system have been verified. Various index tests of the prototype of the power supply have met the requirements, and all power supplies will be produced in mid-April. Open-loop and closed-loop testing for resistive wall modes will be available soon.

Minioral

Yes

IEEE Member

No

Are you a student?

Yes

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