



IAEA FEC 201

Contribution ID: 393

Type: Poster

Overview of Keda Torus eXperiment Initial Results

Thursday, 20 October 2016 08:30 (4 hours)

The Keda Torus eXperiment (KTX) is a new reversed field pinch (RFP) device at the University of Science and Technology of China. KTX is complementary to the existing international Reversed Field Pinch (RFP) facilities. KTX includes the vacuum chamber, conducting shell, magnetic field windings, power supply, active control coils, vacuum pump, wall baking and data acquisition system, KTX construction and assembly were completed on Aug. 1st, 2015 and the first plasma was obtained on Aug. 15th, 2015. Intensive conditioning and optimization of the machine are underway to ramp up the plasma current towards full operation. An active feedback mode control system has been implemented. The pulsed power supply systems for poloidal field (PF) and toroidal field (TF), using thyristor and energy storage capacitors, have been tested and commissioned. In the first phase of KTX, the total stored energy is 1.6 MJ for both PF and TF systems. The flexibility for the TF power supply enables both reversed toroidal field (RFP) and stable toroidal field (tokamak) operation modes. The probe arrays for electric and magnetic field measurement, 2D double-foil soft x-ray arrays, multi-channel x-ray analysers, middle plane H α line detector, fast reciprocating Langmuir probes and 7-chord interferometry/polarimetry diagnostics are currently used in KTX for commission. KTX will be upgraded to the second phase after completion of the first operation phase. KTX program will address some important RFP physics like the impact of 3D structure on plasma flow, and magnetic turbulence and plasma wall interaction, among other topics.

Paper Number

EX/P5-19

Country or International Organization

China

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Session Classification: Poster 5

Track Classification: EXD - Magnetic Confinement Experiments: Plasma-material interactions; divertors; limiters; scrape-off layer (SOL)