

EAST SUPERCONDUCTING TOKAMAK DIVERTOR DESIGN (P2-F-16)

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EAST is a full superconducting tokamak, The main parameters have been described in many other papers. It has been complete assembly and vacuum test started from end of January. Although all of the TF coils and most of the PF coils have been tested their superconducting performance in testing facility the device will still be cool down to test all cryogenic system, TF coils and PF coils without vacuum vessel ports. All the ports, divertor and other in vessel components will be installed after cool down test.

EAST divertor is up down symmetric to supply possibility operate both single null and double null plasma configuration. The geometry of the divertor is based on simulations using the B2-EIRENE Monte Carlo code. The reference configuration for the EAST divertor is an inner vertical target, an outer vertical target with an open private flux region and a dome below the X-point. The vertical target is inclined so as to intercept the magnetic field lines of the separatrix at an acute angle, giving deep inboard and outboard channels in which expect to establish a partially detached plasma regime. In this regime, while the plasma remains attached in the outer region of the SOL, the plasma is detached from the PFCs in the region near the separatrix causing the power profile to broaden and power to be radiated to other surfaces. Together with the lower end of each vertical target and dome forms a cross-section that confines neutral hydrogenic particles in the divertor channels aids partial plasma detachment and particle exhaust.

The plasma facing material for EAST divertor is a doped graphite developed in China. CuCrZr heat sink with cooling channels are bolted to stainless steel supports. Graphite tiles are bolted to heat sink with graphite foil improve thermal contact. In-vessel cryo-pumps are both install behind dome and outer vertical target for particles exhaust.

EM loads bring by eddy current and halo current have been considered in divertor structure design and analyses. Different input plasma heating power has been considered in thermal analayese.