

Neutral Beam Injection Simulation of EAST

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EAST (Experimental Advanced Superconducting Tokamak) is a fully superconducting tokamak with single/double null divertor configuration. Its main parameters are: the major radius 1.75m, the minor radius 0.40m, elongation 1.6-2, triangularity 0.4-0.7, the toroidal magnetic field 3.5T. The NBI (Neutral Beam Inject) system of EAST contains two deuterium beamlines, which beam power is 4MW and energy is 50~80 keV. The angles between the two beamlines and the major radial direction are 66.15° and 74.85.

Neutral beam heating in EAST tokamak is simulated using NUBEAM code. The NUBEAM module is a Monte Carlo package for time dependent modeling of fast ion species in an axisymmetric tokamak. With the numerical simulation, the scenarios of the future neutral beam heating in EAST plasma are predicted. Beam power deposition, trapped fraction, driver current, heating efficiency, power loss and toroidal rotation was analyzed under different plasma conditions. The neutral beam heating and current drives with variable injection angle are also analyzed by the simulation.

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