

Simulation and design of a reflection magnet for the EAST neutral beam system

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The simulation and design of a reflection magnet to be installed in the EAST neutral beam injection system is reported. It is the function of a reflection magnet that dumps the residual ions and produces a neutral beam. Since the residual ions would hit some surface of the neutral beam injector and cause significant damage due to thermal overload and give rise to an additional source of a gas due to desorption, outgassing and recombination. A parametric design and simulation for the reflection magnet was carried out. For a deuterium beam with 42cm as the bending radius, the intensity of reflection magnet field is about 1376Gs at the energy of 80keV. In order to determine position of the ion dump and the surface power load, a particle simulation with Monte Carlo was developed to study ion trajectories and the interaction with background particles in magnet region. In addition, the louver design is introduced.

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