



Recent Progress in the SUNIST Spherical Tokamak

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The recent research activities of the SUNIST spherical tokamak focus on MHD activities during ramp up and decay phase, eddy current and its effects on plasma equilibrium, nonlinear interactions between electrostatic and magnetic turbulences, and fast measurements of edge plasmas. The toroidal Alfvén eigenmodes during minor disruptions have been found in the ohmic plasmas of the SUNIST spherical tokamak. The dynamics of the sheet current during fast ramp up was studied by inserting a radial magnetic probes array into the periphery of ohmic plasmas. The eddy currents flowing in the split vacuum vessel of SUNIST have a 3D structure. An improved response function method is

developed and successfully analyzes the temporal and spatial evolution of the eddy current. The nature of nonlinear interactions among electromagnetic fluctuations measured by two sets of probe arrays in three different dynamic stages (phase-I: current ramp-up; phase-II: stationary discharge and phase-III: internal reconnection event) is studied. An ultra-fast reciprocating (up to 20 m/s) probe has been developed to get the radial profile of electrostatic parameters of the short pulse (< 20 ms) ohmic plasmas in one shot. A radial magnetic probes array was inserted into the periphery of ohmic plasmas and was used to study the sheet current dynamics during fast ramp up.