

EX/P7-41 : Observation of Intermittent Plasma Ejection from a Highly Overdense Spherical Tokamak Plasma Maintained by Electron Bernstein Wave Heating and Current Drive in LATE



Non-inductive spherical tokamak (ST) formation by electron Bernstein (EB) wave in a highly overdense regime is investigated in the LATE device. By adjusting the polarization of injected microwave for efficient O-X-B mode conversion and exciting EB wave in the first propagation band, the plasma current I_p is ramped up to ~ 12 kA and the line-averaged electron density increases up to ~ 7 times the plasma cutoff density with ~ 60 kW 2.45 GHz microwave.

When the density increases and I_p exceeds ~ 5 kA, intermittent spikes in magnetic probe signals are observed for the first time. The width of spikes is ~ 50 μ sec. Extreme ultra-violet radiation signals and fast CCD camera images show that the hot plasma inside the last closed flux surface (LCFS) is ejected through LCFS simultaneously with the spike signals. This ejection events are repeated intermittently, while the averaged interval becomes short and the amplitude becomes large as I_p increases. Repetition of large ejection events causes saturation or gradual decrease of the density and the plasma current.

