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Self-consistent full-wave simulation of wave heating and current drive in tokamak plasmas ATSUSHI FUKUYAMA, AKITSUGU SONODA, Dept. Nucl. Eng., Kyoto University — The time evolution of a velocity distribution function affects the wave propagation and absorption in plasmas. Self-consistent analysis of wave heating and current drive requires to describe the time evolution of wave structures, velocity distribution functions and background plasmas. Using the integrated tokamak simulation code, TASK, we have carried out full wave simulations of ICRF minority-ion heating in a large tokamak and ECRF heating in a small tokamak. The formation of energetic ions enhances the absorption of ICRF waves and modify the radial profile of power deposition. The tunneling of the EC waves through the cutoff layer and the absorption near the upper hybrid resonance were described for the first time. In order to extend the applicability of the analysis, formulation of the full wave analysis and the Fokker-Planck analysis including the finite gyroradius effects will be also presented.

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