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Kinetic integrated modeling of tokamak plasmas by TASK3G[1] A. FUKUYAMA, S. MURAKAMI, A. WAKASA, H. NUGA, T. OKAMOTO, Kyoto University — Deviation of momentum distribution function from the Maxwellian is unavoidable in tokamak plasmas under heating and current drive. The deviation may affect transport, global stability, diagnostics and fusion reaction rate of burning plasmas. In order to describe the time evolution of the momentum distribution functions of plasma species self-consistently, we have developed a kinetic version of the integrated tokamak modeling code TASK3G as the third generation of the TASK code. Transport, heating and current drive are described by the bounce averaged Fokker-Planck equation. The calculated momentum distribution function is used for the analyses of wave propagation and absorption, global stability, and diagnostics. The bounce-averaged Fokker-Planck equation includes nonlinear Coulomb collision, quasi-linear wave interaction, neoclassical and turbulent-driven radial transport and particle source/sink. A typical example of TASK3G result for ITER burning plasma will be presented.

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Atsushi Fukuyama
Kyoto University

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