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TH/P6-13: Kinetic Integrated Modeling of Burning Plasmas in Tokamaks

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In order to self-consistently describe the behavior of burning plasmas in the presence of energetic particles, we have been developing a kinetic integrated tokamak modeling code TASK3G.This modeling is based on the behavior of the momentum distribution function of each particlespecies. The time evolution of the momentum distribution function is described by an advancedFokker-Planck component TASK/FP and the influence of energetic particles on global stabilityis studied by a full wave component TASK/WM. The start up of ITER plasmas with multi-scheme heating and current drive is studied including radial transport and fusion reaction ratecalculated from the momentum distribution function. We have confirmed that the momentumdependence of the radial diffusion coefficients strongly affects the profiles of energetic ions andfusion output power. The linear stability of global eigen modes in the presence of energeticparticles is also discussed.

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