

ELM and ELM-control Simulations

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Future devices like JT-60SA, ITER and DEMO require quantitative predictions of pedestal density and temperature levels, as well as divertor heat fluxes, to improve global confinement capabilities while preventing divertor erosion/melting in the planning of future experiments. Such predictions can be obtained from non-linear MHD codes like JOEKEK, for which systematic validation against current experiments is necessary. In this paper, we show the validation of ELM simulations with JOEKEK using quantitative comparison against JT-60U experiments. Note this is the first JOEKEK validation of ELM simulations at exact Spitzer resistivity. In addition, we demonstrate the essential importance of the separatrix position, required for a successful agreement with experimental data. On the basis of this validation, we propose estimates of ELM size, ELM-induced divertor heat-fluxes, and pre-ELM pedestal pressure, for future JT-60SA scenarios.

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