

Abstract Submitted
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Modeling of fluctuating edge plasmas and ELMs with macro-blob approach¹ A.YU. PIGAROV, S.I. KRASHENINNIKOV, D. RUDAKOV, UCSD, T.D. ROGNLIEN, LLNL — The Macro-Blob (MB) approach has been developed [1] to simulate the intermittent non-diffusive transport (via blobs and ELMs) in edge plasmas within the framework of 2-D transport code UEDGE (the corresponding version is UEDGE-MB). UEDGE-MB has shown [2] its capability of simulating both long-scale evolution of background plasma and fast spatiotemporal dynamics of blobs, resulting in dynamic plasma equilibrium under periodic sequence of MBs. We present new results of UEDGE-MB modeling, in which intermittent transport is represented as a random sequence of many macro-blobs (RSMB) based on experimental distributions of ordinary blobs over sizes and velocity for various regimes on DIII-D tokamak. Characteristics of edge plasma in RSMBs, both fluctuating and averaged over time interval series, will be analyzed and compared with experimental data. Intermittent particle/energy fluxes, plasma radiation, and plasma-wall interactions will be quantified. We also discuss the extended UEDGE-MB model to simulate type-I ELMs. Initial results on ELM cycle modeling will be presented and analysis of plasma particle/energy transport, radiation, impurity generation rates, and power loadings on material surfaces will be given.

[1] A. Pigarov et al., PoP 18, 092503 (2011)

[2] A. Pigarov et al., PoP 19 (2012).

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