Abstract Submitted
for the DPP13 Meeting of
The American Physical Society

Transport of Tungsten and Beryllium Droplets in ITER[1] R.D. SMIRNOV, B.T. BROWN, S.I. KRASHENINNIKOV, UCSD, T.D. ROGNLIEN, LLNL — Recent experiments on ASDEX-Upgrade [1] and JET [2] tokamaks demonstrate that melting of tungsten and beryllium plasma-facing components and ejection of molten material in form of droplets can occur in transient plasma events relevant to ITER. As the experiments and previous simulations [3] show, the ejected material can significantly affect impurity content and discharge stability in present tokamaks. Thus, it is important to evaluate transport and possible impact of the molten ejectile on ITER operation. In this work we present results of modeling with DUSTT/UEDGE code of tungsten and beryllium droplet transport in ITER. The ejection of various quantities of the droplets with different sizes and velocities from top, mid-plane, and divertor locations is simulated. The increase of core impurity influx and critical amounts of the ejected material, which can cause discharge termination, are evaluated. The produced by droplet ejection long range impurity transport and re-deposition are also discussed.

[1] K. Krieger et al., Phys. Scr. T145 (2011) 014067.
[2] G. Sergienko et al., PFMC-14 (2013) A104.
[3] R.D. Smirnov et al., J. Nulc. Mater. 415 (2011) S1067.

[1]Work is supported by US DOE Grant DE-FG02-06ER54852 at UCSD.

Roman Smirnov
UCSD

Date submitted: 10 Jul 2013 Electronic form version 1.4