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**Dynamics of tokamak plasma surface current in 3D ideal MHD model**[1] SERGEI A. GALKIN, V.A. SVIDZINSKI, Far-Tech Inc., L.E. ZAKHAROV, PPPL — Interest in the surface current which can arise on perturbed sharp plasma vacuum interface in tokamaks was recently generated by a few papers (see [1-4] and references therein). In dangerous disruption events with plasma-touching-wall scenarios, the surface current can be shared with the wall leading to the strong, damaging forces acting on the wall [2] A relatively simple analytic definition of $\delta$-function surface current proportional to a jump of tangential component of magnetic field nevertheless leads to a complex computational problem on the moving plasma-vacuum interface, requiring the incorporation of non-linear 3D plasma dynamics even in one-fluid ideal MHD. The Disruption Simulation Code (DSC), which had recently been developed in a fully 3D toroidal geometry with adaptation to the moving plasma boundary, is an appropriate tool for accurate self-consistent $\delta$function surface current calculation. Progress on the DSC-3D development will be presented. Self-consistent surface current calculation under non-linear dynamics of low m kink mode and VDE will be discussed.

[1] L.E. Zakharov, Phys. Plasmas, **15**, 062507 (2008)
[2] A.J. Webster, Phys. Plasmas **17**, 110708 (2010)
[3] A.J. Webster, Phys. Plasmas **18**, 112507 (2011)
[4] L.E. Zakharov, S.A. Galkin, S.N. Gerasimov, Phys. Plasmas **19**, 055703 (2012)

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