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Runaway Electrons Modeling and Nanoparticle Plasma Jet Penetration into Tokamak Plasma[1] S. A. GALKIN, I. N. BOGATU, Far-Tech Inc. — A novel idea to probe runaway electrons (REs) [1] by superfast injection of high velocity nanoparticle plasma jet (NPPJ) from a plasma accelerator [2,3] needs to be sustained by both RE dynamics modeling and simulation of NPPJ penetration through increasing tokamak magnetic field. We present our recent progress in both areas. RE simulation is based on the model [4], including Dreicer and "avalanche" mechanisms of RE generation, with emphasis on high Zeff effects. The high-density hyper-velocity C60 and BN NPPJ penetration through transversal B-field is conducted with the Hybrid Electro-Magnetic code (HEM-2D) [5] in cylindrical coordinates, with 1/R B-field dependence for both DIII-D and ITER tokamaks. [1] I.N. Bogatu, J.R. Thompson, S.A. Galkin, J.S. Kim, "Probing Runaway Electrons with Nanoparticle Plasma Jet", Bull. APS DPP 59(15), NP8.00058 (2014); [2-3] I.N. Bogatu, S.A. Galkin, J.S. Kim: [2] J. Fusion Energy 27, 6, 2008, [3] J. Fusion Energy 28, 144, 2009; [4] H. Smith et al., Phys. Plasmas 13, 102502, 2006; [5] S.A. Galkin, Bull. APS DPP 2008, BO5.005, https://www.researchgate.net/publication/252593039

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