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Physics of the Er-well structure development after L-H bifurcation from the edge gyrokinetic code XGC[1] SEUNG-HOE KU, CHOONG-SEOCK CHANG, R.M. CHURCHIL, ROBERT HAGER, Princeton Plasma Physics Laboratory — Previous gyrokinetic simulation of the L-H bifurcation [1,2] ended, due to lack of computing time, right after the turbulence suppression. The turbulent Reynolds-stress driven ExB-shearing started the turbulence-suppression process and the X-point orbit-loss driven ExB-shearing finished the process. Even though the ExB shearing rate from the curvature in the edge electrostatic potential was sufficient to give the turbulence suppression, an Er-well was not formed yet right after the bifurcation. This year, with the operation of the world 1 computer Summit, we continue the simulation until the Er-well is formed, pressure gradient steepens, and the neoclassical equilibrium Er becomes dominant. We will give a detailed report on how the Reynolds stress, the X-point orbit loss, the neoclassical force-balance physics, the neutral particles, and edge rotation play their roles in building up the pedestal right after the bifurcation event. Details of the turbulence dynamics change will also be reported.
[1] C.S. Chang et al., Phys. Rev. Lett. 118, 175001 (2017)
[2] S. Ku et al., Phys. Plasmas, 25, 056107 (2018)

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