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GBS: Global 3D simulation of tokamak edge region BEN ZHU, DUSTIN FISHER, BARRETT ROGERS, Dept. of Physics and Astronomy, Dartmouth College, PAOLO RICCI, Centre de Recherches en Physique des Plasmas (CRPP), Ecole Polytechnique Federale de Lausanne (EPFL), Lausanne, Switzerland — A 3D two-fluid global code, namely Global Braginskii Solver (GBS), is being developed to explore the physics of turbulent transport, confinement, self-consistent profile formation, pedestal scaling and related phenomena in the edge region of tokamaks. Aimed at solving drift-reduced Braginskii equations [1] in complex magnetic geometry, the GBS is used for turbulence simulation in SOL region. In the recent upgrade, the simulation domain is expanded into close flux region with twist-shift boundary conditions. Hence, the new GBS code is able to explore global transport physics in an annular full-torus domain from the top of the pedestal into the far SOL. We are in the process of identifying and analyzing the linear and nonlinear instabilities in the system using the new GBS code. Preliminary results will be presented and compared with other codes if possible.

[1] A. Zeiler, J. F. Drake and B. Rogers, Phys. Plasmas 4, 2134 (1997)

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