Abstract Submitted
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Nonlinear Simulations of Peeling-Ballooning modes in ITER H-mode scenario[1] X.Q. XU, LLNL, B. DUDSON, U of York, M.V. UMANSKY, LLNL, P.B. SNYDER, GA, H. WILSON, U of York — A minimum set of equations based on the Peeling-Ballooning (P-B) model with non-ideal physics effects (toroidal flow shear, diamagnetic drift, ExB drift, resistivity, and anomalous electron viscosity) is found to produce some essential features of pedestal collapse when using the BOUT++ simulation code. It is found from nonlinear simulations for a realistic high Lundquist number that the pedestal collapses are limited to the edge region and the ELMs size is about 8-10% of of the pedestal stored energy, which is consistent with many observations of large ELMs. Nonlinear simulations demonstrate that the nonlinear P-B modes trigger magnetic reconnection, which then leads to the partial collapse of the pedestal. For one of the latest designs of the ITER 15MA inductive H-mode scenario (under the burning condition), linear growth rate, the ELM size, and power deposition pattern on ITER plasma facing components will be quantified.

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