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Analysis of Weakly Coherent mode on C-Mod with the BOUT++ code Z.X. LIU, ASIPP, X.Q. XU, LLNL, X. GAO, ASIPP, A.E. HUBBARD, J. HUGHES, J.R. WALK, C. THEILER, MIT Plasma Science and Fusion Center, T.Y. XIA, T. ZHANG, ASIPP, E. DAVIS, MIT Plasma Science and Fusion Center, J.G. LI, ASIPP — Edge turbulence in I-mode is characterized by a strong reduction of mid-frequency turbulence and the appearance of a higher-frequency fluctuation, dubbed the "weakly-coherent mode" (WCM). WCM has been well characterized by BOUT++ code. In the simulation, the magnetic equilibrium is generated using the kinetic EFIT with measured pressure profile and the calculated bootstrap current from the Sauter model. The linear simulations are carried out using fits to measured plasma density, electron temperature and electron field profiles, assuming quasi-neutral. WCM in I-mode is driven by Drift Alfven wave (DAW) mode and Ballooning mode, and resistivity plays an important role. In the linear simulation, strong DAM instability has been found at n¿=20, and both the mode structures and the electron diamagnetic direction are consistent with the DAW mode. In the nonlinear simulation, the frequency spectrum of the mode at n=20 is similar to reflectometry measurements at the same location. Particle diffusivity is larger than thermal, normalized density fluctuation is larger than the electron temperature fluctuation, and simulated Xe and Xi are close to experimental Xeff. Some predictions about how to drive WCM will also be presented.

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