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The characteristics of the micro-turbulence in the pedestal region of DIII-D Tokamak[1] JINGFEI MA, Univ of Texas, Austin, XUEQIAO XU, Lawrence Livermore National Laboratory, RICH GROEBNER, General Atomics — Two types of the electromagnetic micro-instabilities have been identified in the pedestal region of DIII-D H-mode ELM-free plasmas (shot number 132016) numerically, using a six-field landau-fluid model under BOUT++ framework. One is the Alfvenic ion temperature gradient (AITG) mode, localized at the outer mid plane, and the other is the drift Alfven instability, localized at the top and bottom of the Tokamak. The AITG mode is driven by the ion temperature gradient and finite β, which is affected by the kinetic effects, such as Finite Larmor Radius (FLR) and Landau resonance. Typically, the FLR destabilizes the modes while the Landau resonance stabilizes them. Besides, the global simulation shows that the pedestal height and width have an evident impact on the growth rate and mode structure of the AITG instability. In order to identify the AITG instability, a set of the global self-consistent equilibria with different pedestal height ("Varyped") are generated, which later are also used to explore the strong impact of β on the AITG. The drift Alfven instability, however, has a very weak dependence on β. Moreover, the drift Alfven instability is the dominant mode, while the AITG is subdominant mode in the steep gradient region of the pedestal.

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