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Character and Behavior of Pedestal Density Turbulence in Inter-ELM periods of Type-I ELMing DIII-D Discharges[1] KSHITISH BARADA, UCLA, A. DIALLO, PPPL, T. L. RHODES, L. ZENG, UCLA, R. GROEBNER, T. OSBORNE, GA — Changes in character and temporal behavior of electron and ion scale density turbulence going from the foot to the top of the pedestal in type-I inter-ELM periods are reported for H-mode discharges of DIII-D tokamak. ITG-scale ($k_\theta \rho_s$~0.3) ñ near pedestal foot increases just after ELM crash and gradually decreases as inter-ELM period progresses. Amplitude of this ITG scale ñ correlates well with the divertor Dα light intensity indicating its role in edge particle transport. TEM scale ($k_\theta \rho_s$~0.7-1.2) ñ measured in the steep gradient region of the pedestal shows a critical gradient behavior i.e. increases once a critical pedestal pressure gradient ($\nabla P_{e,ped}$) is reached and its saturation correlates with that of $\nabla P_{e,ped}$. TEM-scale ($k_\theta \rho_s$~1-2) ñ measured around pedestal top has stronger amplitude compared to that in the steep gradient region, consistent with higher ExB shear in the steep gradient region suppressing more of this TEM-scale ñ. Adding ECH at ρ~0.5, pedestal density gradient decreases, temperature gradient increases, and ELM frequency increases. Steep gradient localized TEM-scale ñ are suppressed and pedestal top TEM-scale ñ are unchanged after adding ECH indicating a possible role of ñ (in steep gradient region) in determining the inter-ELM period. Understanding these fluctuation behaviors will help gaining predictive capability of H-mode pedestal evolution.

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