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Comparative study between ion-scale turbulence measurements and gyrokinetic simulations[1] W. LEE, S. H. KO, M. J. CHOI, W. H. KO, K. D. LEE, National Fusion Research Institute, J. LEEM, G. S. YUN, Pohang University of Science and Technology, H. K. PARK, Ulsan National Institute of Science and Technology, W. X. WANG, R. V. BUDNY, Princeton Plasma Physics Laboratory, Y. S. PARK, Columbia University, N. C. LUHMANN, JR., University of California at Davis, K. W. KIM, Kyungpook National University, KSTAR TEAM — Ion gyroscale density fluctuations were measured with a microwave imaging reflectometer (MIR) in neutral beam injected L-mode plasmas on KSTAR. The spatial and temporal characteristic scales of the measured fluctuations were studied by comparing with the local equilibrium parameters relevant to the ion-scale turbulence. Linear and nonlinear gyrokinetic simulations predicted unstable modes with poloidal wavenumbers of $\sim$3 cm^{-1} (or $k_\theta \rho_s \sim 0.4$) and the wavenumbers were also identified from the measured fluctuations. The poloidal wavenumber can be derived from the measured mode frequency and poloidal velocity. The dominant mode frequency and poloidal velocity were obtained from cross correlations among 16 poloidal channels. Both the mode frequency and poloidal velocity mostly are primarily due to the E x B flow velocity in fast rotating plasmas with neutral beam injection.

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