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Characteristics of magnetic and electrostatic turbulence in the edge plasma of HL-2A tokamak MIN XU, LIN NIE, RUI KE, Southwestern Institute of Physics, YI YU, School of Nuclear Science and Technology, USTC, TAO LAN, Department of Modern Physics, USTC, WULU ZHONG, Southwestern Institute of Physics, XIAOLAN ZOU, CEA, IRFM, F-13108 Saint-Paul-lez-Durance, France, DONG GUO, Southwestern Institute of Physics, BODA YUAN, School of Nuclear Science and Technology, USTC, ZHANHUI WANG, Southwestern Institute of Physics, YIFAN WU, School of Nuclear Science and Technology, USTC, XURU DUAN, Southwestern Institute of Physics, HL-2A TEAM — Simultaneous measurement of magnetic and electrostatic turbulence in the HL-2A tokamak edge plasma has been carried out by using a multifunctional reciprocating probe. This probe is able to simultaneously measure the 3-dimensional magnetic fluctuation, toroidal rotation velocity, as well as plasma density, potential, and electron temperature. The measured magnetic turbulence is broad band, and peaks in the frequency ranges 20-50kHz and 250-350kHz. It is generally associated with 0.2-0.3 Gauss fluctuation. The coherence between floating potential and magnetic fluctuation is low in these two frequency ranges and is relatively high in 100-250kHz. The particle flux induced by magnetic turbulence is relatively small as compared to that induced by electrostatic turbulence. One thing worth noting is that the electrostatic turbulence with high frequencies (100-500kHz) is equally important as turbulence with lower frequencies (peaks around 30-40kHz) in particle, momentum, and electron heat transport. Other statistics such as measured Reynolds stress and Maxwell stress will also be presented.

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