

NONTHERMAL ELECTROSTATIC PLASMA MODES IN THE TERRESTRIAL IONOSPHERE

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Nonthermal ion-acoustic and Langmuir modes are important to a variety of topics within the field of ionospheric and space physics. A number of mechanisms have been proposed to explain the origins of these nonthermal electrostatic modes. Although several of these mechanisms may be effective in enhancing one or both modes, only Langmuir turbulence is well-supported by both observations and modeling. We present new observations by the EISCAT VHF (220 MHz) radar of the spectra of up- and down-going Langmuir and ion-acoustic waves at wave vectors of approximately 9 m^{-1} , including additional features of natural cavitating Langmuir turbulence, and show related modeling results. We conclude by discussing the current understanding of ionospheric Langmuir turbulence.