



## **Non-Maxwellianity of electron distributions and their source regions**

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Identifying regions where electron distributions strongly deviate from Maxwellian distributions and understanding the basic physical processes driving this deviation is of high importance in space plasma physics. These are the regions where kinetic plasma process can strongly affect the large-scale plasma properties and dynamics. Examples include reconnection diffusion regions, shocks, strong turbulence, and current sheets. Using the Magnetospheric Multiscale (MMS) spacecraft, we evaluate and quantify the deviations of electron distributions from bi-Maxwellian distribution functions; for example, using agyrotropy measures and comparisons of observed distributions with the Maxwellian distributions predicted from electron moments. We investigate where these distributions develop, focusing on turbulent regions in the solar wind, foreshock and bowshock, magnetosheath, and the magnetopause and determine under what conditions these deviations from bi-Maxwellian distributions occur. We discuss these how these measures relate to turbulence and applications to the potential THOR mission.