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Turbulence in the pristine solar wind and foreshock

Alexander Pitna, Jana Safrankova, and Zdenek Nemecek

Charles University, Faculty of Mathematics and Physics, Department of Surface and Plasma Science, Prague, Czech Republic (offelius@gmail.com)

Turbulence in the solar wind is a complex phenomenon that has been intensively studied for decades. Due to the insufficient amount of high-resolution plasma moments, the understanding of solar wind fluctuations in the dissipation range of turbulence is limited, while we know much more about properties of turbulence in the inertial range. In this paper, we investigate the changes that occur at both inertial and ion scales of turbulence when the pristine solar wind enters the terrestrial foreshock. Analyzing high-resolution plasma measurements of the BMSW instrument onboard the Spektr-R spacecraft, we discuss the modifications of power spectral densities of the solar wind speed and density with respect to various positions in the Earth's foreshock. We observe a higher relative increase of the power of MHD fluctuations (compared to their solar wind level) than the relative increase of the power in the kinetic range for both the density and velocity fluctuations. We suppose that ULF waves that are generated by different kinetic instabilities dominate the inertial range of turbulence and the kinetic region remains relatively intact.