
What is the role of whistler waves in shaping of the solar wind electron function between 0.17 and 1 AU ?

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Résumé

In the solar wind, the electron distribution function is composed of different population (core, halo, strahl) whose the proportion surprisingly varies as a function of heliocentric distance. Whistler waves, electromagnetic waves around 0.1 fce, are thought to play an important role in shaping the electron velocity distribution function, in particular by diffusing particles from the energetic populations to the less energetic ones. However, there are no clear evidence that whistler waves are sufficiently present nor that the diffusion is effectively at work. To assess the role of whistler waves, we first analyzed the data of the Solar Orbiter and Parker Solar Probe mission between 0.17 and 1 AU to detect and characterize the waves in the plasma frame, as a function of distance and solar wind velocity. Next, we computed the diffusion coefficients (using the quasi-linear theory) for different waves properties, which allows us to determine which parameters are efficient for the scattering. We will present the details of the analysis and the results obtained so far.

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