SOLAR WIND PROPERTIES THROUGHOUT THE HELIOSPHERE BY MULTI-SPACECRAFT ANALYSIS

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A multi-spacecraft study of the solar wind plasma properties is performed throughout the heliosphere from quiet Sun solar wind electron and ion measurements by STEREO et al. We find that the solar wind bulk proton and helium, the electron core and halo propagate moreorless radially with similar velocity. This solar wind bulk velocity statistically remains constant with the heliospheric radial distance, but significant acceleration and deceleration takes place around compression regions, where the slow and fast streams interact. These processes are acompanied by modification of other solar wind parameters. In order to keep the quasi-neutrality of the solar wind plasma the ion and electron densities vary approximately together. Their temperatures vary in a different way due to the different heating processes. Studying the solar wind ion and electron velocity distribution functions we analyze the proton beam and electron strahl dependence on their plasma background and the magnetic field strength and orientation.

Solar wind, multi-spacecraft, heliosphere

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