



Solar wind properties deduced from helium abundance

Tereza Durovcova, Jana Safrankova, and Zdenek Nemecek

Faculty of Mathematics and Physics, Charles University, Prague, Czech Republic

Helium plays a significant role in dynamics and formation of the structure of the solar corona and solar wind. The relative abundance of helium to hydrogen is often used for a determination of an origin of solar wind structures. Typically, in the slow solar wind, it tends to be lower and more variable than in the fast solar wind and it is often considerably enhanced in the interplanetary coronal mass ejections. We utilized Wind observations of the solar wind plasma and magnetic field to study solar wind properties where helium content serves as their indicator. 2D histograms of the ratio of proton and alpha velocities and the cone angle of the interplanetary magnetic field were used for the long-term statistical study. We found various combinations of solar wind properties that differ in parameters of the helium component. Finally, we discuss these changes in view of solar wind sources and a solar wind evolution along the path to the L1 point.