



## **Probing with PIC simulations the plasma dynamics of solar wind in a vicinity of the Heliospheric Current Sheet at various distances from the Sun**

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There are number of peculiarities in the solar wind plasma dynamics observed around the sector boundaries at 1 AU which are shown to be most likely resulted from a quasi-continuous magnetic reconnection at the Heliocentric Current Sheet (HCS) (Zharkova, Khabarova, ApJ, 2012). In the current study we explore further a transformation of physical conditions in the HCS and compare the dynamics of observed characteristics of magnetic field, electrons and protons' in the HCS vicinity at different distances from the Sun and different times of the satellites' passing. By using different spacecraft's data gathered over the entire space era we analyze the radial and longitudinal transformation of the HCS shape and strength at different phases of the solar cycle. We carry out a comparison of the observed solar wind plasma parameters with those derived for particle and electro-magnetic fields dynamics from 3D PIC modeling and evaluate the level of turbulence inside the HCS occurring at different distances from the Sun.