

Correlation between the Magnetic Fields Measured by ACE and WIND

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Abstract:

We investigate the fluctuating interplanetary magnetic field and solar wind around 1 AU utilizing two-point measurement made by ACE and WIND. The ideal separation between the two spacecrafts is of the order of the coherence scale made previously from a single spacecraft, which gives the reason for the highly coherent measurement between ACE and WIND. We focus on the correlation analysis of the interplanetary magnetic fields in the transverse direction in RTN coordinate system, and find the expected decaying correlation with increasing spatial lag and the transverse correlation scale is $\sim 1.76 \cdot 10^6$ km. We also study on the correlation scale in the directions parallel and perpendicular to the mean magnetic fields, and find the coherence scale is shortest in the perpendicular direction.