

Waves in polar coronal holes: differences between plumes and interplumes

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Abstract. We present EIS/Hinode and SUMER/SoHO spectroscopic observations of propagating disturbances in the interplume region of a polar coronal hole. The disturbances show the signature of acceleration while propagating from the near-limb region to greater heights. The observation was carried out on 13th November 2007 as JOP196/HOP045 programme during a joint campaign between SUMER and Hinode. The SUMER spectroscopic observation gives information about the fluctuation in radiance as well as in line-of-sight velocity whereas EIS slot images provide only radiances but maximises the probability of overlap between the two instruments. In interplume, we detect the presence of propagating waves with periods of 15 to 20 min and speeds increasing from 130 km/s at 20'' above the limb up to to 330 km/s around 160'' above limb. The adjacent plume region also shows the presence of propagating disturbances with the same range of periods. However, over the same height range, speeds are increasing only moderately from 130 km/s to 165 km/s and the waves appear to be dissipating in the far off-limb region, in strong contrast to the interplume region. Our results provide spectroscopic evidence of acceleration of propagating disturbances in the polar region close to the Sun, and support the conclusion that interplumes are the preferred channel for the acceleration of the fast solar wind.