

GPS phase fluctuations associated with high speed flows in the cusp ionosphere

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Using ionospheric scintillation measurements from GPS receivers of Canadian High Arctic Ionospheric Network (CHAIN) and flows measured by both of Kapuskasing (KAP) and Saskatoon (SAS) SuperDARN radars, we found that near cusp region the GPS phase scintillations fluctuated mostly associated with the varied velocity of flows. After statistic study over a 3 year period (2013-2015), a surprising result will be presented in this work that it is nearly linear relationship between GPS phase fluctuations and flows around cusp region. On the contrary, the behavior of GPS amplitude scintillations is always quiet even with higher velocity of flows, which is obviously different from the manners of phase fluctuations. The two various different performance associated with high speed flows may caused by differentiated dependency of flows of their possible generation mechanisms. The results will be useful to further study the scintillation mechanisms and can help to improve the scintillation models in polar region.

