

A study on causes of GPS fluctuations at high, middle, and low latitudes

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It is known that the phase fluctuations of GPS signals are mainly caused by the ionospheric irregularities. There were some studies investigating the causes of GPS fluctuations at different latitudes. Recently, Chen et al. [2017] analyzed the data of GPS, ionosonde, ISR, and FORMOSAT-3 over Tromsø (69.7°N, 18.9°E) during 2007-2008, and examined the causes of GPS fluctuations at high latitudes during solar minimum. At Wuhan (30.5°N, 114.4°E), Chen et al. [2011] explored the possible causes of GPS fluctuations during solar maximum, through comparing fluctuations of GPS with spread-F of ionosonde. Lee et al. [2009] and Lee et al. [2013] studied the causes of GPS fluctuations at low latitudes during solar maximum and minimum, respectively. Both Lee et al. [2009] and Lee et al. [2013] analyzed fluctuations of GPS, spread-F of ionosonde, and plasma bubbles of satellite over Chungli (24.9°N, 121.2°E). Nevertheless, the mutual comparison of the results between these previous studies can not be done, because the data periods in the studies were not the same. Thus, the causes of GPS fluctuations are not completely understood. In order to more completely know the causes of GPS fluctuations, it is necessary to conduct an observation of GPS fluctuations simultaneously at high, middle, and low latitudes. In this simultaneous observation, the data of other instruments (ionosonde, spaceborne, and FORMOSAT-3) at high, middle, and low latitudes are included. The data periods cover solar minimum and maximum. The results of this study would be presented and discussed in the symposium.

References

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