Analysis of ionospheric TEC fluctuation by rocket

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It is known that atmospheric waves arised by massive earthquakes, typhoons and volcanic eruptions cause the ionospheric variation. In recent years, ionospheric fluctuations excited by rocket launches have been confirmed (Lin et al., 2014,2017). In case of Taepodong 2, the first wave of TEC fluctuations is confirmed due to the chemical reaction with ionospheric plasmas and the exhaust of the rocket about 5 minutes after the launch and the second wave was confirmed after about 30 minutes from the launch. To examine the ionospheric disturbances apart from the trajectories of rockets, in this study, TEC fluctuation due to the launches of H2A rocket No.25 and No. 29 we examined using GEONET data. The first waves of the TEC fluctuations were confirmed around hundreds kilometers from the rocket trajectory 5 minutes after launch of both of H2A rockets. The first waves appeared as large decreases in VTEC, which is consistent with the previous study of Taepodong 2. Calculating the propagation time of the sound waves from the points on the trajectories of TEC. The second waves were also observed around the 30 minutes after the rocket launches. Calculating the arrival time of sound waves for the second waves, the seconds waves once reflected on the ground were affected by the second waves.

Keywords: ionospheric, rocket, TEC