

A possible effect of rainfall on medium scale electron density fluctuations in dayside ionosphere

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Electron density (Ne) fluctuation with spatial scale of a few tens of km - a few hundred km is observed very frequently in middle or low latitude along the orbit of the Swarm satellites. The cause of such medium scale fluctuation could be a plasma instability or atmospheric waves. On the night side, it is well known that the Rayleigh-Taylor instability or Perkins instability can cause such fluctuations. The Ne fluctuations discussed in this presentation are observed on the dayside where the above-mentioned instabilities, in general, may not develop easily. The fluctuations could be caused by the atmospheric waves, i.e., acoustic waves or gravity waves. However, the amplitudes of fluctuations tend to be larger where the gradient of Ne along the satellite orbit is large by the equatorial fountain effect. Although it is not very clear, a tendency that the global distribution of rainfall correlates with the amplitude of Ne fluctuation. In this presentation, the global distribution of Ne fluctuation under various conditions and its correlation with global map of rainfall published by the JAXA/GSMaP project will be discussed.

Keywords: electron density fluctuation, dayside ionosphere, Swarm satellites