

The importance of tropospheric water vapor in space weather

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Space weather events are the electro-magnetic disturbance on the vicinity of the Earth mainly originated by the solar activity. Recently the influence of space weather events has been discussed in various fields. Many scientists have been discussing the mechanism of space weather phenomena, and in addition that, some industry people started the discussion of the influences of space weather to social infrastructure, for example telecommunication, broadcast, satellite positioning, air navigation, and electric supply.

On the view of users, the scale and duration of influence is more important than the mechanism of the influence. To reply these user's requirement, the scientists should consider whole system from the Sun to the Earth's ground. For example, the largest error factor of satellite positioning is the delay in the ionosphere, however, the effect of water vapor in the troposphere is not negligible. This effect is applied to "GPS meteorology" to discuss the global distribution of water vapor. The information is useful to improve our developing atmosphere-ionosphere coupling model "GAIA".

In addition, the millimeter wave frequency has been frequently used recently, which is influenced by water vapor in the air. When we consider the total use of radio wave, it is important to consider the tropospheric condition.

It is expected to discuss the merit of consideration of the effect of water vapor in the troposphere in this talk.

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