

A comparison of precipitable water vapor obtained from GPS and radiosonde

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In order to research the accuracy of precipitable water vapor (PWV) obtained from GEONET Global Positioning System (GPS), we compared PWV obtained from GPS (GPS_PWV) with that obtained from radiosonde (SONDE_PWV).

We used radiosonde data at 14 stations in Japan, and also GPS data of GEONET stations established by Geographical Survey Institute (GSI) near radiosonde stations during January 1999 and December 2000 in the present investigation.

We compared PWVs at 00UTC with those at 12UTC. At 00UTC, GPS_PWV was almost the same as value to SONDE_PWV when PWV was less than 60mm. When PWV was over 60mm, GPS_PWV was become smaller than SONDE_PWV. On the other hand, at 12UTC, GPS_PWV was usually become smaller than SONDE_PWV when PWV was high.

When it was rainy or very humid, GPS_PWV tended to be much smaller than SONDE_PWV. This tendency was caused by the fact that the sensor of the hygrometer of radiosonde was wet.

Finally, we investigated relationships between PWV difference and some meteorological phenomena such as snowfall, wind, but there was no clear correlations were found between them.