

# The Topic Related to Diurnal variation of atmospheric water vapor based on GPS observations over Taiwan

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Atmospheric water vapor plays a key role in the atmospheric radiation budget and global hydrological cycles. Traditionally its diurnal variation is primarily examined by the observations from the radiosonde sounding, which is typically launched twice daily and, hence, insufficient to capture the representative characteristics of the diurnal variation. Recently, the GPS observations that provide continuous measurements of water vapor were used to study the diurnal variations in the USA [Aiguo et al. 2002]. In this contribution, we investigate the diurnal variation of water vapor based on GPS observations in Taiwan whose climatology dramatically differs from that in the Northern America. The differences are primarily due to the fact that Taiwan is located in the boundary of the sub-tropical and tropical regions with much more abundant of water vapor in the atmosphere in addition to its fast changing topography surrounding by the oceans.

The GPS receiver records tracking data from 7-8 satellites every epoch, typically 30 seconds for CWB's GPS stations. Path delays were then derived from the GPS tracking data by using the Bernese v4.2 software [Beutler et al.,

1996] and from International GPS Service precise orbits. These path delay data were used to derive the 30 min-averaged path delay using a cut-off angle  $10^\circ$ .

Summer is the rainy season of the year in Taiwan. Rainfall is a very important source of water resources to Taiwan. If there is not enough rainfall in summer, Taiwan will be likely lack of water for the rest of the year. To understand the climatology of atmospheric water vapor, we study its diurnal variation in summer in this paper.

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