

## GPS PWV Estimation during Dust Storm Season

DongSeob Song<sup>1\*</sup>

<sup>1</sup>Dept. of Ocean Construction Engineering, The Kangwon National University

Dust storms originate from the arid area are of concern to microwave propagation and satellite telemetry due to they can be influenced to carrier depolarization and phase delay. As technology advances, and new methods of making measurements are developed or made more economical, it becomes feasible to make comparative measurements of the same parameters using independent techniques. One such technique is the ground-based GPS meteorology, which is able to quickly and inexpensively expand the number of global upper-air moisture observations for radiosonde and satellite verification. On 31 March-02 April 2007, heavy Asian dust storm hit the Korean peninsula in East Asia causing extensive damages. In this paper, the Korean GPS permanent stations were used to estimate precipitable water vapor (PWV) during dust storm season. The GPS PWV estimates have monitored the density variations of dust storm associated with anomalous atmospheric wet/dry conditions. In order to monitor the GPS PWV variations to establish the relationship with the level of atmospheric concentration of aerosol particulates during an Asian dust storm, GPS PWV estimations were analyzed during March 30-April 04, 2007. In this period, the maximum value of PM10 (2,019 microgram/cubicmeter) was recorded in Daegu station at 07hr April 01 2007 (UTC) and at Seoul is 1,233 microgram/cubicmeter (12hr April 01) and at Cheonan is 1,261 microgram/cubicmeter (15hr April 01). It can be found that the actual GPS PWV variations are correlated with the spatio-temporal variability of the PM10 data.

### Acknowledgement

This research was supported by Basic Science Research Program through the National Research Foundation of Korea (NRF) funded by the Ministry of Education, Science and Technology (2012-0007973).

Keywords: GPS PWV, Dust Storm, PM10