

P23

Correction of cloud effect in total column ozone measurement from PANDORA by using Kalman Filter

Kanghyun Baek(1), Jae Hwan Kim(1), Juseon Bak(1), Dae Sung Choi(1), Jhoon Kim(2)

(1) Pusan National University, Republic of Korea,

(2) Yonsei University, Republic of Korea

Korea has a plan to launch the Geostationary Environment Monitoring Spectrometer (GEMS) into geostationary orbit in 2018 to monitor tropospheric air pollutant on hourly basis over East Asia. Because ground based measurements are required to validate ozone products from GEMS, we consider to use PANDORA instrument based on the DOAS method, which can provide hourly total column ozone (TCO) measurements even in the presence of aerosols and clouds. This study is to examine the performance of TCO from PANDORA, which was installed in Busan and Seoul, by comparing with TCO from Brewer, and OMI from March 2012 to December 2013. PANDORA TCO showed a high correlation of 0.99 with a negative bias of 2-3% relative to Brewer TCO. However, the correlation between PANDORA and OMI TCO was lower than that between Brewer and OMI TCO. We found that Brewer didn't provide TCO in the presence of clouds. However, even though PANDORA measurements were filtered out during thick cloudy condition, the PANDORA still showed unusual high ozone during thin cloudy condition. In order to have continuous PANDORA measurements for comparison with hourly GEMS measurements, the PANDORA measurements under thin cloudy condition are required to be corrected. We have performed the correction of PANDORA observations using Kalman filter which is a set of mathematical equations that provides an efficient computational solution of the least-squares method. When we applied this approach, the result showed the improvement in correlation between PANDORA and OMI TCO as much as that between Brewer and OMI TCO