

5.047 Validation of Brewer and Pandora measurements using OMI total.

Presenting Author:

Jae Kim, Department of Atmospheric Science, Pusan National University, Busan, Korea, iamjaekim@gmail.com

Co-Authors:

Kanghyun Baek, Department of Atmospheric Science, Pusan National University, Busan, Korea

Jhoon Kim, Department of Atmospheric Science, Yonsei University, Seoul, Korea

Abstract:

Korea will launch the GEMS instrument in 2019 onboard the geostationary satellite to monitor atmospheric constituents with high spatial and temporal resolutions. The purpose of this study is to examine the performance of total ozone from ground-based Pandora and Brewer instrument that will be used for validation of the GEMS ozone product. Satellite retrieval algorithm is used to process the entire satellite dataset, and instrument characteristics typically change slowly over the life of the satellite. Thus, the short-term stability of satellite measurements can be used to estimate the performance of the ground-based measurement network as well as to identify potential problems at individual stations. As a reference for satellite ozone measurements, we have selected total ozone data from OMI-TOMS V8.5 algorithm, because it is a robust algorithm that has been well studied to identify its various error sources. We validated ground-based Pandora and Brewer total ozone measurements using OMI total ozone data collected over South Korea from March 2012 to December 2014. The Brewer ozone measurements at Pohang showed significant deviation from overall seasonal variation during the study period. In addition, in the presence of clouds, Pandora ozone measurements are usually ~7% higher than OMI total ozone data. To filter out these cloud-contaminated data, we applied a Kalman filter to the Pandora measurements. The diurnal variation in the Kalman-filtered Pandora data agrees well with the Brewer data, and the correlation of Kalman-filtered Pandora data with TOM-TOMS total ozone is significantly improved from 0.89 to 0.99 at Seoul and from 0.93 to 0.99 at Busan.