**Inter-comparison of Aerosol Optical Depth values measured by Portable Sunphotometer and AERONET/SKYNET ground stations**

Inkwon Baek1\*, Jihyun Choi1, Sun-Hwa Kim2, Jae-Heon Jung3, Woojin Jeon4

1 Manager, Corporate Research Institute, Perpixel Inc., Republic of Korea

2 CEO, Corporate Research Institute, Perpixel Inc, Republic of Korea
3 Senior Researcher, Department of Satellite Ground Station R&D Division, Korea Aerospace

Research Institute, Daejeon, Republic of Korea

4 Researcher, Department of Satellite Ground Station R&D Division, Korea Aerospace

Research Institute, Daejeon, Republic of Korea

\*aaron77@perpixel.co.kr

***ABSTRACT***

To utilize optical satellite images, it is essential to perform atmospheric correction to mitigate image distortion caused by atmospheric particles and to conduct absolute radiometric calibration to adjust the radiance measured by the sensor. For the absolute radiometric calibration process, radiative transfer modeling requires the measurement of the columnar aerosol optical depth (AOD). To evaluate the quality of AOD measurements, AODs from MICROTOPS II, the CE318-1 of the Aerosol Robotic Network were compared over Incheon, Uiwang, and Daejeon in South Korea. The field-measurements were performed under clear and cloudy day in Spring and Summer(May-June), located at about at most 15.81 km from the AERONET or SKYNET sites. The result of this study showed that the Root Mean Square Error of the AOD observations of MICROTOPS II and AERONET at wavelengths of 440 nm, 500 nm, 675 nm, and 870 nm were 0.0001, 0.0013, 0.0006, and 0.0000 on clean day. On cloudy day, the RMSE at these wavelengths were 0.0002, 0.0030, 0.0039, and 0.0054, respectively, indicating that the measurement results of MICROTOPS II and AERONET were very similar. Furthermore, the RMSE of AOD observations of MICROTOPS II and SKYNET at wavelengths of 500 nm, 675 nm, and 870 nm were 0.0038, 0.0003, and 0.0004, respectively. The AOD measurements between sunphotometer devices were similar within a radius of 15.81 km.

**Keywords:** Inter-comparison, MICROTOPS II, AERONET, SKYNET, AOD