

Intercomparison of Total Ozone Column Observed by Pandora and Brewer Spectrophotometers at Taipei

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A long-term record (1965 to present) of total ozone (O_3) column was observed at Taipei made by the Central Weather Bureau (CWB) in Taiwan. Our instrument setup began with Dobson spectrophotometer and was replaced by Brewer spectrophotometer in 1985, and two Brewers are presently operating. In 2013, we performed an intercomparison experiment of total ozone by using the NASA Pandora and CWB Brewer to understanding the performance of new instruments in the subtropical climate. The results show that Pandora and Brewer have good linear correlation (correlation coefficient is 0.74) and the tendency of daily variability is similar. The mean value of total ozone column for Pandora and Brewer are 270 DU and 283 DU, respectively, suggesting that Pandora could have low bias. However, when we compare to Aura satellite measurement, Pandora shows better results. Furthermore, we compared total ozone column with surface ozone concentration measured by nearby air quality station. We found that the daily trend shows mostly in accordance between columnar and surface ozone, implying the main influence of the total ozone change in Taipei comes from the surface. In addition, Pandora provides higher temporal resolution compared to Brewer, which is particularly important for the evaluation of some highly variable species [e.g. O_3 , nitrogen dioxide (NO_2), aerosols] in the lower troposphere or boundary layer.

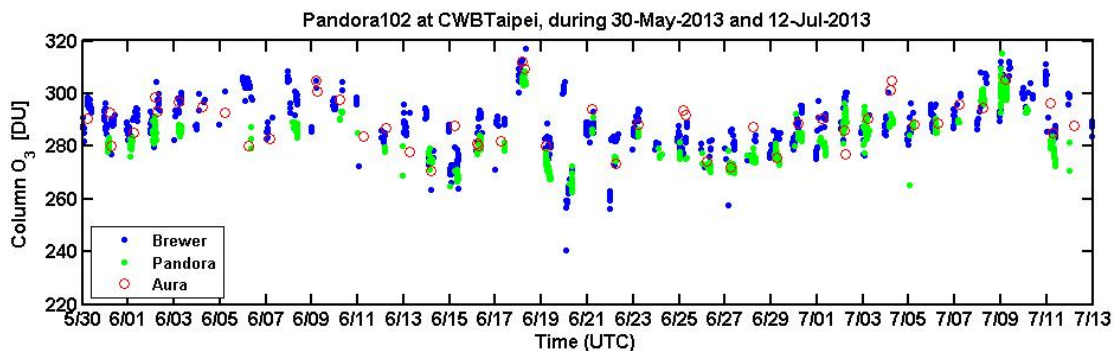


Figure 1. The results from intercomparison experiment of Brewer and NASA Pandora.

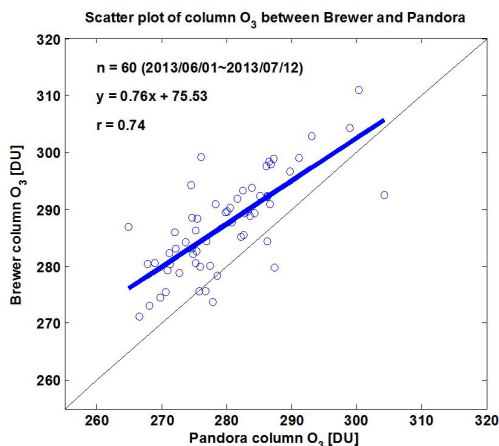


Figure 2. Scatter plot of total ozone column observed by Brewer and NASA Pandora.