Geophysical Research Abstracts
Vol. 20, EGU2018-11549, 2018
EGU General Assembly 2018
© Author(s) 2018. CC Attribution 4.0 license.

Characteristic distributions and Source Identification of PM2.5 and Black carbon at Socheongcho Ocean Research Station in the Yellow Sea

Haneol Jeon (1), Hojun Rhee (1), Meehye Lee (1), Jinyong Jeong (2), Inki Min (2), and Jaeseol Shim (2)

(1) Dept. of Earth and environmental sciences, Korea University, Seoul Korea, Republic of (jhe8906@korea.ac.kr), (2) Division of Coastal and Harbour Engineering Research, Korea Institute of Oceanic Science and Technology, Ansan, Korea, Republic of

Socheongcho Ocean Research Station (SORS) has been established in northern Yellow Sea by the Korea Institute of Ocean Science and Technology (KIOST). At SORS, PM2.5 and Black carbon (BC) were measured every 10 minutes during October 2014 $\sim$ June 2017 using beta-ray absorption method (FH62C14, Thermo. Inc, USA) and Multi Angle Absorption Photometer (MAAP; Model 5012, Thermo. Inc, USA), respectively. In addition, CO, CO_2 and CH4 were determined by Cavity Ring Down Spectroscopy (CRDS; Model G2401, Picarro. Inc, USA). Measurements were intermittently interrupted for SORS maintenance reasons. For PM2.5 and BC, the mean, 90th %tile and maximum concentrations were 25, 48, and 177 ug/m3 and 1.16, 2.29, and 20.07 ug/m3, respectively. There was no clear diurnal variation observed for both species. PM2.5 and BC concentrations were higher in cold seasons than in warm seasons. The highest PM2.5 and BC concentrations (>99th %tile) were more frequently observed in winter. The possible sources of PM2.5 and BC were examined using Conditional Probability Function (CPF), Potential Source Contribution Function (PSCF), and Concentration Weighted Trajectory (CWT) analysis. PM and BC were highly elevated (>90th %tile) as an influence of airmass from Shandong Province in China. Chinese outflow mainly contributed to entire PM distribution as much as 72.9% and the contributions were also calculated to be 20.4% and 6.7% as an influence of South Korean and North Korean outflow.