3.108 Decrease of Black Carbon Aerosol in air masses transported from China at Suzu, Noto Peninsula, Japan.

Early Career Scientist

Presenting Author:

Makoto ENDO, Graduate school of Science and Engineering, Ibaraki University, 17nm303s@vc.ibaraki.ac.jp

Co-Authors:

Kazuyuki KITA, Graduate school of Science and Engineering, Ibaraki University

Yasuhiro SADANAGA, Department of Applied Chemistry, Osaka Prefecture University

Atsusi MATSUKI, The Institute of Nature and Environmental Technology, Kanazawa University

Abstract:

Black carbon aerosol (BC) is considered as one of major contributors to global climate change because BC strongly absorbs solar radiation to heat surrounding air. Coal and biofuel burning in China for industrial and residential use has been supposed to be significant BC emission source. Recent fuel conversion in China may reduce atmospheric BC concentration globally. In this study, we are trying to find change in BC concentration in air masses transported from China to Japan in winter.

BC concentration has been measured with light absorption photometry technique at Noto atmospheric monitoring observatory (37.5N, 137.4E, 10m ASL) in Suzu, Japan. Carbon monoxide (CO) concentration has also been measured with NDIR technique at this site. Both BC and CO frequently increased simultaneously at Noto in winter. Defining a high-BC event by measured BC concentration exceeding its lower 84 percentile value (>0.3 mg m^{-3}), we calculated integrate excess BC value during each BC event, and compared the values in 2014-2017 winter (December, January and February). We selected high-BC events that occurred with the transport from China based on the backward trajectory analysis.

Both the number of high-BC events and BC peak values in the events tend to decrease between 2014 and 2018 winters. The central 50 % ranges of the integrated excess BC values during high-BC events are 1.2-5.9, 0.9-4.9, 0.7-2.6, and 0.9-2.5 (mg m^{-3} hour) in 2014-2015, 2015-2016, 2016-2017, and 2017-2018 winters, respectively. This result shows that BC increase in air masses from China from 2014-2015 winter to 2016-2017 winter, but that difference between 2016-2017 and 2017-2018 winters was not clear. Variation of excess CO and excess BC/CO ratio will be also discussed.