

Investigation of Atmospheric Aerosol Particles and gases by R/V Mirai cruise over the Arctic Ocean on 2017

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Atmospheric aerosol particles play an important role in Arctic climate through the absorbing and scattering of solar radiation. Also, the deposition of light-absorbing particles on the surface reduces the Earth's albedo and accelerates snow/ice melting by absorbing the sunlight. However, the observational information has been still insufficient to assess their contribution over the Arctic region. In this study, we conducted the ship-based measurements of marine aerosol particles (black carbon (BC), and fluorescent property) and trace gases (ozone and carbon monoxide) using R/V Mirai during a cruise across the Arctic Ocean and Bering Sea (23 August –4 October 2017). The measured BC mass concentration over the Arctic Ocean in the latitudinal region $> 70^{\circ}\text{N}$ was an overall mean value of $3.5 \pm 2.0 \text{ ng/m}^3$. This value was almost same to the levels recorded during our previous observations in the Arctic cruise on September during 2014 -2016. We captured relatively high BC mass concentration and/or CO mixing ratio events at 4 and 7-12 September 2017. The trajectory and BC property suggested that the source of BC on 4 September could be oil field at north of Alaska. We will present further analysis on the size distribution, BC mixing state, during the cruise in the presentation.

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