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Variation of atmospheric carbon monoxide over the Arctic Ocean during summer 2012

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Atmospheric carbon monoxide (CO) plays an important role in ozone-related chemistry in the troposphere, especially under low-NO_x conditions like the open ocean. During summer 2012, we performed a continuous high-resolution (0.1Hz) shipboard measurement of atmospheric CO over the Arctic Ocean. We also simulated the observation using a 3-D global chemical transport model (the Model for OZone And Related chemical Tracers-4; MOZART-4) for further analysis of the observed results. In the model, tags for each sources and emission regions of CO are applied and this enables us to delineate the source composition of the observations.
Along with the observed variation of CO concentration during the research cruise, we will present in detailed analysis of the variation of source components and change of regional contributions. We found large ($\sim$80ppbv) variation of CO concentration in the Arctic Ocean which is mostly influenced by the variation of biomass burning activity. The contribution of anthropogenic emission is limited over the Arctic Ocean, although the northeast Asian anthropogenic emission shows a dominant component of transported anthropogenic CO. Also, our analysis shows, near the Bering Strait, Europe is the main emission region for anthropogenic CO.