Yamashita, Y., M. Takigawa, D. Goto, H. Yashiro, M. Satoh, Y. Kanaya, F. Taketani, and T. Miyakawa, 2021: Effect of model resolution on black Carbon transport from Siberia to the Arctic associated with the well-developed low-pressure systems in September. *J. Meteor. Soc. Japan*, **99**, https://doi.org/10.2151/jmsj.2021-014.

Plain Language Summary: Atmospheric transport of black carbon (BC) affects the absorption/scattering of solar radiation, precipitation, and snow/ice cover, especially in areas of low human activity such as the Arctic. The resolution dependency of simulated BC transport from Siberia to the Arctic, related to the well-developed low-pressure systems in September, was evaluated using the Nonhydrostatic Icosahedral Atmospheric Model–Spectral Radiation Transport Model for Aerosol Species (NICAM-SPRINTARS) with fine (~ 56 km) and coarse (~ 220 km) horizontal resolutions.

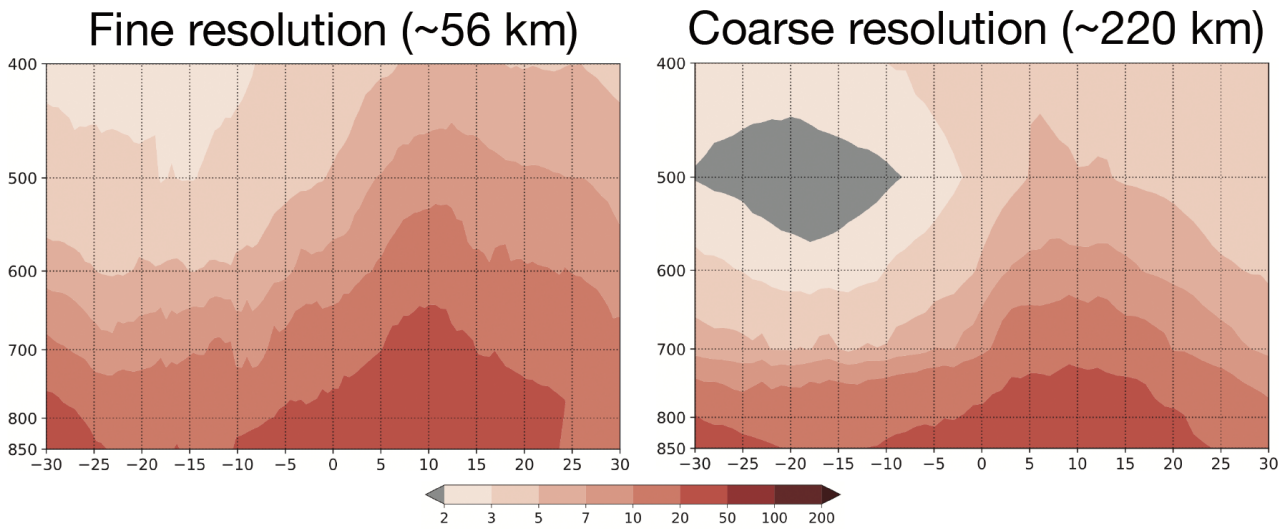

Figure 1. Longitude–height section at the latitude=0° line centered on the low centers for the composite of the BC concentrations (shading, ng m^{-3})

- The transport of the BC to the Arctic is evaluated with the composite analysis for the developed low-pressure events in September from 2015–2018.
- The high-BC area is located eastwards of the low's center in relation to the ascending motion over the low's center and northward/eastward area.
- This study indicates that the material transport processes to the Arctic by the well-developed low-pressure systems are enhanced in the fine horizontal resolution (~56 km) relative to the coarse horizontal resolution (~220 km) models, since the area of the maximum ascending motion has a small horizontal scale.
- This implies that the fine horizontal resolution (~56 km) will be desirable for the precise treatment of transport processes in the future chemistry transport models.