# 4.201 Characteristics of Atmospheric Black Carbon Observed by R/V Mirai over the Bering Sea and Arctic Ocean.

Presenting Author:
**Fumikazu Taketani**, JAMSTEC Institute of Arctic Climate and Environmental Research, Yokohama, Japan, taketani@jamstec.go.jp

Co-Authors:
**Takuma Miyakawa**, JAMSTEC Institute of Arctic Climate and Environmental Research, Yokohama, Japan
**Masayuki Takigawa**, JAMSTEC Institute of Arctic Climate and Environmental Research, Yokohama, Japan
**Maashiro Yamaguchi**, JAMSTEC Institute of Arctic Climate and Environmental Research, Yokohama, Japan
**Yugo Kanaya**, JAMSTEC Institute of Arctic Climate and Environmental Research, Yokohama, Japan
**Yuichi Komazaki**, JAMSTEC Institute of Arctic Climate and Environmental Research, Yokohama, Japan
**Saki Kato**, Fukuoka University, Department of Earth System Science, Fukuoka, Japan
**Hisahiro Takashima**, Fukuoka University, Department of Earth System Science, Fukuoka, Japan
**Petr Mordovskoi**, JAMSTEC Institute of Arctic Climate and Environmental Research, Yokohama, Japan
**Yasunori Tohjima**, NIES Center for Environmental Measurement and Analysis, Tsukuba, Japan

Abstract:

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. Black carbon (BC) is a major component of light-absorbing particulate matter in the atmosphere, causing positive radiative forcing. Therefore, the impact of BC on the Arctic climate needs to be assessed; however, observational information has been still insufficient. Over the Arctic Ocean, we have been conducting ship-based observations for BC using a single particle soot photometer (SP2) at September on R/V Mirai every year since 2014. To estimate the transport pathways of BC, we have also conducted model simulations during the period of cruise using a regional transport model (WRF-Chem 3.8.1).
Observations were continuously conducted along the ship track between Japan and Arctic Ocean via Bering Sea. Analyzed Data were employed after eliminating data influenced by ship exhaust. The observed average mass concentration in >70°N at September during the cruises on 2014 – 2017 was ~2 ng/$m^3$. This value was lower than the levels (~10 ng/$m^3$) recorded at the ground-based observation site of Barrow (Alaska (71°N,156.6°W))

on September [Sharma et al. 2013 JGR]. We captured relatively high BC mass concentrations over Bering Sea and Arctic Ocean during the cruises in 2014 - 2017. The regional transport model indicated the biomass burning at Siberia should be possible source in most cases. We will present further analysis on the BC mixing state, and comparison with other measured gases.