Kajino, M., M. Deushi, T. T. Sekiyama, N. Oshima, K. Yumimoto, T. Y. Tanaka, J. Ching, A. Hashimoto, T. Yamamoto, M. Ikegami, A. Kamada, M. Miyashita, Y. Inomata, S. Shima, A. Takami, A. Shimizu, S. Hatakeyama, Y. Sadanaga, H. Irie, K. Adachi, Y. Zaizen, Y. Igarashi, H. Ueda, T. Maki, and M. Mikami, 2019: NHM-Chem, the Japan Meteorological Agency's regional meteorology – chemistry model: model evaluations toward the consistent predictions of the chemical, physical, and optical properties of aerosols. *J. Meteor. Soc. Japan*, **97**, https://doi.org/10.2151/jmsj.2019-020.

Plain Language Summary: A regional meteorology – chemistry model (NHM-Chem) has been developed for various operational and research purposes such as simulations of oxidant, Kosa, $PM_{2.5}$, contaminations of land and ocean ecosystems, and aerosol size and chemistry both of which are important for health and regional climate change. In order to consistently evaluate the model performance, the simulated results need to be verified from various aspects. Methods to evaluate the model are suggested and the results obtained from the evaluation are presented in the paper.

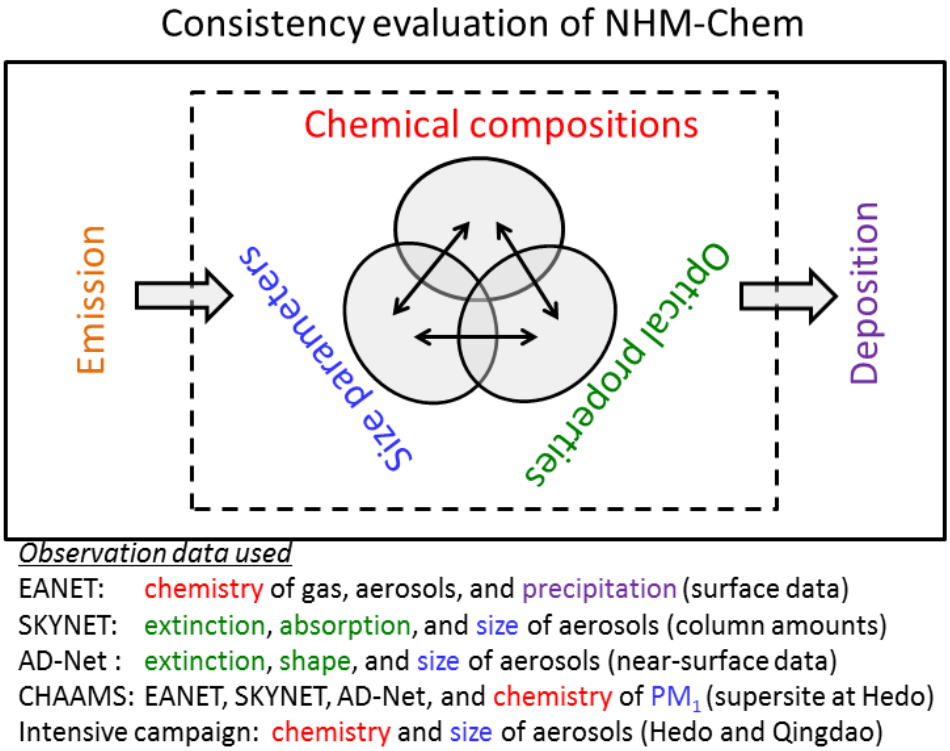

Figure 1. Concept of the present study

- Presented are consistent evaluation methods of NHM-Chem, which comprises of three aerosol schemes, developed for regional climate study, air quality study, and operational forecast.
- Simulated mass, size, and deposition of SO_4^{2-} and NH_4^+ agreed well, whereas those of NO_3^-, sea-salt, and dust needed improvement.
- Simulated near-surface optical properties of spherical particles agreed well, whereas those of column amounts and near-surface optical properties of dust needed improvement.