

Climatological analysis framework for storm events in the East China Sea based on the time series data at Cape Hedo

*Yingnan Jiang¹, Hidenori AIKI^{2,3}, Yuki Kanno⁴

1. Graduate School of Environmental Studies, Nagoya University, 2. Institute for Space-Earth Environmental Research, Nagoya University, 3. Application Laboratory, Japan Agency for Marine-Earth Science and Technology, 4. Central Research Institute of Electric Power Industry

Continuous atmospheric aerosol observations conducted at Cape Hedo, Okinawa, Japan since August 2005 provides a high spatial and temporal resolution dataset to reveal the vertical distribution of aerosols and pollution. Strong wind is one of the factors that have an important influence on the distribution of aerosols. Here we have defined a strong wind event as wind speed exceeding 10 m/s and lasting for more than 6 hours based on the JRA55-do reanalysis data. We have identified 622 strong wind events in total from August 2005 to June 2020. Using the composite time series approach, we have analyzed the variation of a set of quantities within a 10-day period of the strong wind events. We note that the vertical distribution range of aerosols in autumn and winter is wider than that in spring and summer, which indicates the seasonal changes of the atmospheric boundary layer height at Cape Hedo. For the western North Pacific region, the changes of the wind field and pressure field in summer are greater than in winter with strong wind events composite. We notice that more typhoon-induced strong wind events appear in summer. In winter, most of the strong wind events are caused by the cold air activity or passage of fronts.

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