



Aerosol impact on the interdecadal variability in tropical cyclone activity over the western North Pacific

Chiharu Takahashi (1), Masahiro Watanabe (1), and Masato Mori (2)

(1) AORI, The University of Tokyo, Kashiwa, Japan (chiha@aori.u-tokyo.ac.jp), (2) RCAST, The University of Tokyo, Tokyo, Japan

Over the past two decades, the number of Tropical cyclone (TCs) has decreased markedly in the southeastern part of the western North Pacific (WNP) as a component of the interdecadal variation. This decrease has partially been explained by an internal low-frequency variability of sea surface temperature (SST) in the Pacific, but influences of external forcing remain unclear. We show that past changes in sulphate aerosol emissions significantly contributed to the observed decreasing trends in TC genesis frequency in the southeastern WNP for 1992–2011, using multiple simulations by a global climate model. This decrease was mainly attributed to the increased vertical wind shear and decreased low-level vorticity, associated with a trans-basin multidecadal SST change driven by aerosol forcing. The near-future projection shows that the aerosol forcing still has some potential influence on decadal TC change, but the projected decreasing frequency is mainly due to increasing greenhouse gases forcing.