Sensitivity of a fine scale SST to wintertime rainfall simulation around Japan

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The impact of high resolution sea surface temperature (SST) data on the winter time climate around Japan is investigated using a WRF model with a horizontal resolution of 20 km. The OISST (0.25 deg) and the JRA25 (JMA Re-Analysis) SST data (1.25deg) are used as the lower boundary condition in the experiments. Generally, the OISST is warmer in the south of the Polar Front over the Japan Sea, the Kuroshio/Oyashio extension, and the coastal regions around Japan comparing with the JRA25 SST because the OISST resolves the small scale features in the SST related to ocean currents. In comparison, the magnitude of surface winds simulated with the OISST is weaker (stronger) on the (colder) warmer SST regions. The difference affects the convergence fields of surface winds, further causing the difference in precipitation. The results suggest a potential impact of small scale features in SST on atmosphere.