



The characteristics of tropical cyclones in a regional climate simulation over CORDEX East Asia domain

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In this study, the warm core characteristics of tropical cyclones (TC) in a 25-km-mesh regional climate simulation over CORDEX East Asia domain from 1988-2009 have been analyzed. Three cumulus parameterization schemes are employed to illustrate the impact of cumulus schemes on the representation of warm core structures in the regional climate simulation. The results show that the warm core strength of TC has significant positive correlation with TC intensity. The stronger the warm core is, the more intense the TC is. In contrast, there is no obvious correlation between the warm core height and TC intensity, especially during the intensifying stage of TCs. Besides the warm core strength, TC intensity is also significantly correlated with temperature anomaly at upper level, and intense TCs show a more obvious upper level warming. The cumulus parameterization schemes show significant differences in both the strength and height of simulated TC warm cores, which are mainly due to the differences in the intensity and radial distribution of convections, as well as the associated latent heating. This study points out that the ability of climate model to simulate TC intensity is influenced by its ability to simulate TC thermal structure, and different cumulus convective parameterization scheme shows different ability to simulate TC thermal structure. Therefore, the choice of cumulus convective parameterization scheme can influence the general performance of climate model in simulation of TC intensity.