## Impacts of four land-use products on the simulation of land surface temperature in East China

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Land surface temperature (LST) plays a crucial role in earth system for its uneven spatial distributions could trigger local circulations through land surface -atmosphere interactions. However, the accuracy of modelled LST depends on land surface characteristics, such as land use/cover types. In this study, the Community Land Model (CLM4.5) and four land-use products were employed to investigate the effect of underlying vegetation characters on LST simulation in East China. Moderate Resolution Imaging Spectroradiometer (MODIS) land surface temperature products (MOIDIS\_LST) and observations from nine sites were used to evaluate the simulated LST. Compared with ground temperature from site observations, the CLM model could properly simulate ground temperature in urban area. However the differences between the MODIS\_LST and simulated LST shown that the model overestimated LST in East China. Over the forest areas, the distributions of LST differences between model and remote sensing from four simulated cases are dissimilar because the different identifications of plant types in four land-use product. We also found a large deviation of leaf area index (LAI) between CLM prescribed value and remote sensing observation. The replacement of LAI in model surface data with MODIS LAI brings the modeled LST closer to MODIS LST. Besides the LAI, other factors contributing to the differences of LST between model and MODIS are also identified, including uncertainties in atmospheric forcing data, MODIS LST product, and land surface plant types identification. These findings could have implications for improving the simulation of land surface energy balance in regional weather models or global climate models.

Keywords: land surface temperautre, land use, CLM4.5