**An Observational Study on Interaction between Typhoons and Underlying Poyang Lake Basin in China**

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**Abstract**

Poyang Lake basin is one of the China inland areas under the impacts of post-landfall typhoons with high frequency. The interaction between typhoon and its underlying surface over this region is investigated using the best track data, surface and sounding observation and global meteorological re-analysis data. Statistical analysis from 1949-2012 shows that typhoons seem to slow down their moving speed and decaying rate when passing across Poyang Lake basin. They generally can maintain for a long time over land and have rainfall reinforcement over Poyang Lake basin. Several typhoons are selected to further examine the condition change of underlying surface and atmosphere during their influence period. Soil and lower atmosphere temperature both were found decreased with reduced diurnal variations, while the soil water content and air humidity increased obviously, due to the cover of typhoon cloud system and its rainfall. When typhoons passing across, the air was heated in upper troposphere firstly and then was cooled in lower troposphere, and the geopotential height of atmosphere reduced with the horizontal wind flows shifting from northerly to southerly over the Poyang Lake basin. Moreover, the mean heat surface fluxes kept positive and the convective available potential energy (CAPE) value was low over the region under the impact of typhoons, indicating that such underlying surface is favorable to the energy budget for typhoon maintenance, and typhoons is likely to trigger the release of CAPE to increase rainfall in turn.

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