

The observed impacts of South Asian summer monsoon on the near-surface turbulent heat exchange over the Southeast Tibet

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The Southeast Tibet is an important region of the Tibetan Plateau bearing the interaction between the Tibetan and the neighbor atmospheric systems. The South Asian summer monsoon (SASM) as a basic climate system in Asia could impact the local atmosphere and the near-surface heat exchange process in the Southeast Tibet. An observational campaign, OSEP2013, was carried out in this region during SASM in 2013. The atmospheric parameters and turbulent heat fluxes were observed and averaged over three different land surfaces of the inhomogeneous landscape during the observation campaign. Results show clear SASM impacts on the local atmosphere and near-surface heat exchange in the Southeast Tibet. The South Asian summer monsoon was onset on June 1, 2013, and experienced a south phase and north phase during OSEP2013. The convection and humidity were increased in the Southeast Tibet by SASM, especially during the north phase. The observation domain received low radiation energy due to the convective clouds brought by SASM, and the soil and air temperatures were lowered as consequence. In addition, the air humidity was increased over this region by the wet air transportation of SASM circulation. The sensible and latent heat transfers were decreased by the low land-air temperature difference and high air humidity during SASM. The latent heat transfer dominated the total heat transfer in the Southeast Tibet due to the low sensible heat transfer in the SASM situation, and the domination was increased as the sensible heat transfer was further decreased during the SASM north phase.