Land surface-atmosphere energy exchanges during pre-monsoon thunderstorm activity over barren and agriculture field sites at two tropical stations

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Surface energy balance studies primarily explore the exchange of energy between the atmosphere and geosphere which is responsible for the occurrence of mesoscale weather phenomenon such as thunderstorms. A primary forcing of the planetary boundary layer thermal characteristics and buoyant development is surface sensible heating. Investigation of surface energy budgeting was concerned of primary importance in many experiments related to thunderstorm dynamics in different parts of world. Over eastern and north-eastern India occurrence of pre-monsoon thunderstorms are quite common and are locally known as *'Kalbaishakhi'* or *Nor'westers*. In the present study, two tropical stations namely Ranchi (23° 25ʹ N, 85° 26ʹ E) and Kharagpur (22° 30' N, 87° 20' E) are chosen where intensive micro-meteorological observations are available as a part of major experimental campaign to understand the dynamics and modeling of thunderstorms. These stations are having different land surface characteristics as the former one is a barren land and the other one is agricultural land. In the present study, the variation of the surface energy balance parameters such as fluxes of radiation, sensible, latent and sensible heat flux; surface meteorological variables during thunderstorm and non-thunderstorm days are studied. The present study has brought clear cut variations of these energy exchanges during the thunderstorm activity at these two field stations.

Keywords: Thunderstorm, Sensible Heat Flux, Latent Heat Flux