



Analysis of the initiation of a mesoscale convective system based on heat and moisture budget calculations

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COSMO runs were performed to simulate a mesoscale convective system (MCS), which was observed on 11 June, 2006 (pre-onset phase of the monsoon, SOP 1). Different simulation scenarios were investigated including a realistic soil moisture distribution (i), a simulation with increased soil moisture (ii) and a homogeneous soil moisture and soil texture in the whole investigation area (iii).

The simulations showed that convection was initiated in all experiments. However, the amount of cells and its origin differed. While in experiment (i) and (iii) several cells were initiated and merged into an organized convective system, in experiment (ii) only a small, short-lived cell was simulated. In order to study the conditions which led to the different evolution, heat and moisture budgets were calculated. The boxes for which budgets were calculated included the whole area, where convective cells were initiated, as well as isolated cells only. The different contributions of the components of the budgets and its differences between the three scenarios were discussed. Special attention was laid on the impact of the components of the budgets (e.g. heat flux convergence, horizontal advection) on the evolution of convection-related parameters (CAPE, CIN) and thermally induced circulation systems.