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# The influence of soil and vegetation parameters on atmospheric variables relevant for convection in the Sahel: A model study

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Mesoscale climate models have been coupled to land surface models in the Sahel in order to account for realistic representations of surface fluxes. These fluxes affect the properties of the boundary layer and hence have an effect on deep convection and rainfall. A problem faced by the land surface models in the Sahel is the lack of measurements of soil and vegetation parameters in the area. Bad estimations for these parameters can lead to unrealistic simulated fluxes with feedback to other parameters.

Therefore, a soil-vegetation-atmosphere transfer model, coupled to a one-dimensional climate model, is tested for its sensitivity to soil and vegetation parameters. The model used in this study is the Advanced Regional Prediction System (ARPS), developed at the University of Oklahoma. Radio-sounding data of four days, representing different conditions, were selected from the HAPEX-Sahel database. These data were used to initialise and evaluate the model. As evaluation variables, the equivalent potential temperature (EPT) and the convective available potential energy (CAPE) at 500m are taken, as they both are closely related to deep convection and rainfall.

The first results show that the model is capable of representing the evolution of boundary-layer characteristics during the evaluation days in the rainy season. For the dry season case however, the boundary-layer height is overestimated by several hundreds of meters. In all four cases, model results at the end of the afternoon (17.00 LT) are within a range of 3 K for the EPT and 200 J/kg for the CAPE. Subsequently, the sensitivity of the modelled EPT and CAPE to the soil and vegetation characteristics has been tested.