



Mesoscale Modelling of Tropical Rainfall in Westafrika

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ABSTRACT: The use of mesoscale models for precipitation forecasts demands adaptation of techniques, which were originally designed for global- and synoptic-scale models. In the IMPETUS Westafrikaprojekt, the *Lokalmodell* (LM) of the German Weather Service is used for case studies of typical rainfall events in West Africa; the main goal within the next years is to use this non hydrostatic model as a regional climate model.

The results of case studies suggest that some of the observed problems originate in the convection parameterization, but a sufficient identification of sources of errors is hardly possible. Deficiencies also arise from incorrect atmospheric input data, boundary (vegetation and land cover) data and possibly from insufficient energy flux calculations into the atmosphere. Another problem of mesoscale rainfall predictions is the chaotic structure of clouds in space and time, which requires statistical approaches for the interpretation of model results.

Three typical rainfall events – a larger scale cloud cluster, a squall line and monsoonal rain – are examined in detail. In ensemble studies the influence of different surface characteristics and variations of input data is studied in order to compare the magnitude of errors with the one caused by convection parameterization schemes.