



Cloud-resolving scale: the challenges and the added values

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Convection scale modelling is a hot topic at the moment both for weather prediction and climate. The crucial point is to determine if and to which extent higher resolution is better than coarser resolution, as well as investigating uncertainties related to model setup and parameterisations. Using the regional climate model CLM (Climate version of the Local Model) driven with ERA-40 reanalysis data, we simulated five years at 2.8 km resolution over a complex terrain in Baden-Württemberg in south-west Germany. As a first step, the sensitivity of the model to simulation domains, frequency of boundary conditions update as well as model parameterization in different seasons are investigated. Then, we assess the added value of higher versus coarser resolution using statistics such as spatial bias, diurnal cycle, probability distribution, and fraction skill score. Our results show that the model is sensitive to the considered modifications to different extent depending on the season. The boundary condition update frequency was found to have a strong impact on the diurnal cycle of precipitation. Added values can be detected in comparison with coarser resolution, but care has to be taken in drawing final conclusions. High resolution better simulates low intensity events as well as extreme events in comparison with the 7km resolution in winter, but the same conclusion cannot be drawn for summer. In addition, we conclude that different evaluation-methods have to be applied to reach grounded results.