

Why do models fail to reproduce low clouds over West Africa?

Supervision: Knippertz, Pante

During summer, low clouds are ubiquitous in southern West Africa and have an important impact on the surface energy balance, thereby controlling low-level temperatures, stability and ultimately rainfall. Recent studies in the framework of the DACCWA project (www.dacciwa.eu) have shown that even high-resolution weather prediction models struggle to reproduce these clouds and their distinct diurnal cycle realistically, not to mention coarse-resolution climate models. The DACCWA field campaign in Savè (Benin), which included the KITcube observational platform, has delivered a very comprehensive and rich dataset to further investigate this phenomenon. An observation-based conceptual model has been developed consisting of distinct phases in the build-up and dissolution of these clouds. The goal of the MSc project is to conduct multiple-nested simulations over Savè using the ICON model down to 100m grid-spacing to identify reasons for the cloud biases. A particular emphasis will be put on aspects such as turbulent mixing and cloud microphysics.