

Keynote6: **13:30-14:15. Kilometer-resolution climate modelling over the tropical and sub-tropical Atlantic**

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Abstract

In the last decade, kilometer-resolution regional climate models have seen a multitude of promising applications related to convective precipitation in a changing climate. Studies have in particular considered extreme events, such as heavy precipitation, flash floods, severe weather (with hail, lightning and wind gusts), as well as organized convective systems (e.g. hurricanes, medicanes and mesoscale convective complexes). However, regarding the representation of tropical clouds, the systematic application of km-resolution climate models has only just started. Here we present a project dedicated to the study of tropical and subtropical cloud feedbacks over the Atlantic. The main motivation is to improve the representation of cloud feedbacks, to assess their role in a changing climate, and to constrain current estimates in climate projections and climate sensitivity. We are working with horizontal resolutions between 550 m and 4.4 km on a range of different computational domains. The largest domain covers a large fraction of the Atlantic (9100x6800 km at a horizontal resolution of 3.3 km). Our work includes multi-year current and future climate simulations using the pseudo-global warming (PGW) approach, the exploitation of a systematic model calibration procedure to constrain uncertain model parameters, validation against a range of in-situ, remote-sensing and reanalysis data sets, as well as convergence studies using different resolutions. The presentation will provide an overview of these activities, with the goal to assess the potential of the approach.