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Supporting observation campaigns with high resolution modeling

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High resolution simulation in support of measurement campaigns offers a promising and emerging way to create large-scale context for small-scale observations of clouds and precipitation processes. As these simulation include the coupling of measured small-scale processes with the circulation, they also help to integrate the research communities from modeling and observations and allow for detailed model evaluations against dedicated observations.

In connection with the measurement campaign NARVAL (August 2016 and December 2013) simulations with a grid-spacing of 2.5 km for the tropical Atlantic region (9000x3300 km), with local refinement to 1.2 km for the western part of the domain, were performed using the icosahedral non-hydrostatic (ICON) general circulation model. These simulations are again used to drive large eddy resolving simulations with the same model for selected days in the high definition clouds and precipitation for advancing climate prediction (HD(CP)2) project.

The simulations are presented with the focus on selected results showing the benefit for the scientific communities doing atmospheric measurements and numerical modeling of climate and weather. Additionally, an outlook will be given on how similar simulations will support the NAWDEX measurement campaign in the North Atlantic and AC3 measurement campaign in the Arctic.