



## **Impact of observations on the AROME-Arctic regional model**

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In the frame of the APPLICATE (Advanced Prediction in Polar regions and beyond: modelling, observing system design and Linkages associated with a Changing Arctic climaTE, <https://applicate.eu>) project, ECMWF (European Centre for Medium-Range Weather Forecasts) is running several observations denial experiments. Having access to the results of these experiments opens a good opportunity for us to fulfill our obligation with the ALERTNESS (Advanced models and weather prediction in the Arctic: Enhanced capacity from observations and polar process representations, <https://www.alertness.no>) project to study the impact of Arctic observations on our operational Arctic regional model AROME-Arctic.

Other peculiarity of these experiments is that almost each observation denial experiment can be driven by similar experiment using the ECMWF global model. This is very different to what we usually do, where all regional observation denial experiments are driven by the operational ECMWF model using full set of observations. The fact that we have access to not only the ECMWF control experiment, but also to all the data denial experiments, also allows us to evaluate the impact of observation gained through the lateral boundary conditions (LBCs) providing a unique opportunity in data assimilation.

In our presentation, we will show in details the impact of different observations (microwave and infrared satellite radiances, atmospheric motion vectors, conventional surface, radiosonde, and aircraft observations) on the analyses and forecasts of the AROME-Arctic. Using the Special Observing Periods (SOP1&2) of Year of Polar Prediction (YOPP), we will be also able to also describe the impact of launching scenario of the radiosondes.