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Impact of non-Arctic observations on the AROME-Arctic regional model

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In the framework of the Applicate project (https://applicate.eu), ECMWF (European Centre for Medium-Range Weather Forecasts) performed global (Bormann et al. 2019) and Arctic (Lawrence et al. 2019) observing system experiments. Use of the results of these experiments as lateral boundary conditions (LBC) for our regional model opens opportunity to study the following: 1) the impact of observations through regional data assimilation (DA); 2) the impact of observations that are assimilated in a global model through LBC in a regional model; 3) the impact of global loss of observations in a regional model; and 4) the impact of non-Arctic observations in an Arctic regional model.

In the framework of the Alertness project, we performed experiments for the two special observation periods (SOP) 1 and 2 and found considerable impact (significant for some cases) of both conventional and satellite observations through both regional DA and LBC. So far, the impact of non-Arctic observations on our Arctic regional model AROME-Arctic analyses and forecasts was checked during SOP1 with microwave radiance only. The impact was found to be positive, especially on day-2 forecasts.

In this presentation, the impact of other non-Arctic observations (conventional and satellite) on our regional model AROME-Arctic will be discussed through different forecast skill scores verification.