

EGU2020-7012

<https://doi.org/10.5194/egusphere-egu2020-7012>

EGU General Assembly 2020

© Author(s) 2020. This work is distributed under the Creative Commons Attribution 4.0 License.



Impact study of scatterometer observations with improved representation error in an Arctic data assimilation system

Máté Mile¹, Roger Randriamampianina¹, and Gert-Jan Marseille²

¹Norwegian Meteorological Institute, Development Centre for Weather Forecasting, Oslo, Norway (matem@met.no)

²Royal Netherlands Meteorological Institute, De Bilt, The Netherlands

Nowadays, satellite observations are providing primary information for initial conditions of state-of-the-art numerical weather prediction (NWP) systems and the amount of remote sensing data in the Global Observing System increases rapidly. However, the way such data are assimilated is usually conservative and sub-optimal especially in high resolution limited-area models. Our objective is to improve the use of scatterometer observations from polar-orbiting satellites by taking into account the observation footprint and reducing the observation representation error through the observation operator.

The variational assimilation system (including 3D- and 4D-Var) of HARMONIE-AROME is widely used for research and operational NWP purposes by many European countries. In most cases, the HARMONIE-AROME model and its data assimilation are run on higher resolution (corresponding to around 2.5km grid size or smaller) than the effective resolution of some satellite observations (e.g. the effective resolution of scatterometer instruments). The use of ASCAT scatterometer observations is studied in an Arctic data assimilation system (AROME-Arctic) and a new observation operator (called supermodding) is evaluated in terms of scatterometer representation error. The results are demonstrated through data assimilation diagnostics, observing system experiments and case studies focusing on the challenges of the Arctic weather forecasting as well.