Workshop
on
Perspectives of data assimilation on hecto-metric scales

Tuesday 10, around 13 CEST to Thursday 12 September, 2024, 13 CEST.
The Workshop will take place at Tofta Strandpensionat, close to Visby

On site Participants

Nils Gustafsson, Xiaohua Yang, Nedjeljaka Zagar, Elias Holm, Loïk Berre, Heikki Järvinen, Ole Vignes, Kristian Mogensen, Tomas Wilhelmsson, Michael Tjernström, Patrick Samuelsson, Tomas Landelius, Jelena Bojarova and Magnus Lindskog

hybrid participants during day 2

Practical information:

Invited guests are kindly asked to confirm their on-site workshop participation before 1 May, 2024. Please note that flight tickets should be booked through Henriette Valsö at IMI (International Meteorological Institute of Sweden), through contact: henriette.valso@misu.su.se

Concerning questions regarding accommodation please contact Jelena (jelena.bojarova@smhi.se) . Accommodation will be fully covered. As well contact Jelena if questions regarding traveling. The second day of the workshop will be open for remote participants and also will include a session dedicated to Nils. The detailed agenda will come closer to the date. As for now we kindly request You to notify Magnus and Jelena (magnus.lindskog@smhi.se; jelena.bojarova@smhi.se) if You would like to share to share some memories they have from Your time together with Nils.

Workshop scope

This workshop is focusing on data assimilation for hectometric scales. How can we build on previous experiences from larger scales and what are the key aspects to address when approaching higher resolutions? Here we will try to take a variety of different aspects into account, including assimilation algorithms, resolution versus domain size, uncertainty estimates and modeling, observation handling, coupling strategy, model spin-up as well as computational aspects. The optimal length of the data assimilation window is determined by two processes. The data assimilation window should be short enough to stay within predictability limits and to be long enough to assure adjustment processes to happen. How should the efficient data assimilation algorithm be designed? How can we profit in the best way from rapidly emerging technologies of data processing and analysis, known as Machine Learning or Artificial Intelligence. Do we need the data assimilation at all on the hecto-metric scales. The workshop is organized in the context of the qCONDOR (a Quasi CONtinuous Data assimilation for nOwcasting and a very short Range forecasting) project of the Swedish National Space Board (SNSA) and is sponsored by the International Meteorological Institute (IMI) Visitors Program of The Meteorological Institute at Stockholm university. The primary activity IMI is to support scientific visits to Sweden within the atmospheric, oceanic and climate sciences and closely related fields. Roughly 50 scientific visits are made possible each year through funding from the institute.

Agenda

Day 1
Session 1. 13.00-15.00

- Background and introduction (Jelena, 40 min)
- Some data assimilation developments and challenges for km-scale (Magnus, 40 min)
- Discussion (40 min)

Coffee break 15.30-18.30

- Role of machine learning (Tomas, 40 min)
- Scale-independent surface modeling and interaction with the atmosphere (Patrick, 40 min)
- Discussion (40 min)

Dinner 19.00

Day 2
Session 1. 9.00-11.00

- Background error covariances for high resolution modeling (Loïk, 30 min)
- Some aspects of tropical data assimilation (Nedjeljka, 30 min)
- Ensemble data assimilation and handling of moisture (Elias, 30 min)
- Discussion (30 min)

Coffee break 11.00-11.30

Session 2. 11.30-13.00

- Observation handling and quality control (Heikki, 30 min)
- Why do we need an ocean model to predict the weather at high resolution? (Kristian, 30 min)
- High resolution re-analysis (Xiaohua, 30 min)
- Discussion (30 min)

Lunch 13.00-14.30

Session 3. 14.30-16.00

- Session devoted to Nils

Coffee break 16.00-16.30

Session 4. 16.30-18.30

- Observation systems for Arctic (Michael, 30 min)
- Dynamics and computational aspects (Ole, 30 min)
- Towards use of GPUs for hectrometric scale computing (Tomas, 30 min)
- Discussion and forming of groups for tomorrow (30 min)

Dinner 19.00

Day 3
Session 1. 9.00-11.00

- Discussions in groups and recommendations

Coffee break 11.00-11.30

Session 2. 11.30-13.00

- Reporting by groups
- Final discussion

Lunch and end of workshop 13.00-14.00