ACCORD

A Consortium for COnvection-scale modelling Research and Development

Organization of DA area in the new ACCORD consortium

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Cooperation within ACCORD DA area - strategy

➢ Formation of teams

- **Research teams**:
  - To deal with some high priority tasks from the rolling work plan
    - Need face-to-face meetings in order to solve together concrete problems
    - Regular video meetings can be also organised
- **Support teams**:
  - Local implementation of developed solutions
  - Guarantee the exchange of knowledge on developments/achievements.
  - Direct interaction with developers
  - Meet at working weeks or at organised on-demand video meetings
- **The Teams' work is organised and supported by the Area leader and the co-chairs**

➢ Avoid repetition of development works

- **Porting of developments**:
  - CSC leaders are responsible for the implementation of the new developments
  - All developments/achievements should be ready to be used in each CSC
  - All developments will be delivered in form of "pluggable" functions into all three CSC DA system
    - Function: comprises all needed manipulation of input data, namelist setup and takes care files naming conventions
  - Developers are responsible for the "functions", short how-to describing the implementation process, changed source codes, and scientific documentation if appropriate
  - Little by little we build a common and modular DA system
  - The functions will be prepared to be called in different steps of the DA process

Cooperation within ACCORD DA area - the Teams

Research teams

- Variational & EnVar in OOPS
- Initialisation/Spinup in nowcasting
- 4D-Var
- Large scale information in LAM DA
- Preparation for future Satellite products
- Assimilation of "rain observations"
- VarBC
- Sub-hourly RUC and continuous DA
- *Coupled DA*
- Assimilation diagnostics, monitoring and verification
- Assimilation and quality control of observations at appropriate scales
- *Machine learning for DA*
- Ground based remote sensing

Support teams

- VarBC implementation
- DAsKIT
- (Fixed station) conventional observations
- Moving platforms
- Ground based remote sensing observations
- Assimilation of retrievals
- Assimilation of (cloud free and cloudy) radiance data
- B computation
- Diagnostic and verification

NEWS

➢ Reports

- HIRLAM, LACE, Météo France and DAsKIT provide concise reports.
  - Used to be communicated via video meetings

➢ Operational suits (?)

➢ Publications

- Tóth, H., Homonnai, V., Mile, M., Várkonyi, A., Kocsis, Zs., Szanyi, K., Tóth, G., Szintai B., and Szépszó G., 2021: Recent developments in the data assimilation of AROME/HU numerical weather prediction model. ***Időjárás*** 125, 4.
- Randriamampianina, R., Horányi, A., Bölöni, G. and Szépszó, G., 2021: Historical observation impact assessments for EUMETNET using the ALADIN/HU limited area model. ***Időjárás*** 125, 4.
- Stanesic, A.; Horvath, K.; Keresturi, E., 2019: Comparison of NMC and Ensemble-Based Climatological Background-Error Covariances in an Operational Limited-Area Data Assimilation System. ***Atmosphere*** 2019, 10, 570. https://doi.org/10.3390/atmos10100570
- Jan Barkmeijer , Magnus Lindskog , Nils Gustafsson , Jelena Bojarova, Roohollah Azad, , Isabel Monteiro, , Pau Escribà , Eoin Whelan , Martin Ridal , Jana Sánchez-Arriola, Ole Vignes, Roel Stappers, Roger Randriamampianina, (2021), "HARMONIE-AROME 4D-Var".***Newsletter ALADIN-HIRLAM*** nº 16, pp 20-34
- Stoffelen et al. (2019) International Research and Development Collaboration results for the Global Application of the Chinese HY-2B Scatterometer; DOI: 10.13140/RG.2.2.15732.58249
- Monteiro, M. et al. (2021) DAsKIT progress report (to be published)
- Monteiro, M. et al. (2020) The DAsKIT programme: status and plans; http://www.umr-cnrm.fr/aladin/IMG/pdf/nl15.pdf
- J. Campins, and B. Navascués (2021): "Assimilation of IASI radiances in AEMET operational suite". ***Newsletter ALADIN-HIRLAM*** nº 16, pp 76-83.
- J. Sánchez-Arriola, B. Navascués (2021): "Assimilation of Doppler Radar Radial Winds data in the HARMONIE-AROME model configuration run at AEMET ". ***Newsletter ALADIN-HIRLAM*** nº 16, pp 65-75.

NEWS

➢ Publications

- J. Sánchez-Arriola , P. Escribà , I, Monteiro , J. Campins , M. Díez , D. Martín , V. Costa , B. Navascues and J. Calvo, (2020), "A major update in AEMET operational suite including radar reflectivity, ASCAT data, humidity in the large scale blending and assimilation of screen level variables in 3DVar". ***Newsletter ALADIN-HIRLAM*** nº 14, pp 128-137.
- Gregow, E., Lindfors, A. V., van der Veen, S. H., Schoenach, D., de Haan, S., & Lindskog, M. (2020). The use of satellite and surface observations for initializing clouds in the HARMONIE NWP model. ***Meteorological Applications***, 27(6), e1965.
- Hintz K. H., C. McNicholas, R. Randriamampianina, H. T. P. Williams. B. Macpherson, M. Mittermaier. J. Onvlee-Hooimeijer, B. Szintai (2021), Crowd-sourced observations for short-range numerical weather prediction: Report from EWGLAM/SRNWP Meeting 2019, ***Atmos Sci Lett.*** 2021;e1031., https://doi.org/10.1002/asl.1031
- Susanna Hagelin, Roohollah Azad, Magnus Lindskog, Harald Schyberg, and Heiner Körnich (2021), Evaluating the use of Aeolus satellite observations in the regional numerical weather prediction (NWP) model Harmonie–Arome. ***Atmos. Meas. Tech.***, 14, 5925–5938, 2021, https://doi.org/10.5194/amt-14-5925-2021
- Lindskog M., A. Dybbroe, R. Randriamampianina (2021), Use of microwave radiances from Metop-C and Feng Yun-3 C/D satellites for a northern European limited-area data assimilation system. ***Adv. Atmos. Sci.,*** https://doi.org/10.1007/s00376-021-0326-5
- Mile, M., Randriamampianina, R., Marseille, G.J., Stoffelen, A. (2021): Supermodding - a special footprint operator for mesoscale data assimilation using scatterometer winds. ***Q.J.R. Meteorol. Soc***., 1–21. https://doi.org/10.1002/qj.3979
- Randriamampianina R., N. Bormann, M. A. Ø. Køltzow, H. Lawrence, I. Sandu, Z.-Q. Wang (2021): Relative impact of observations on a regional Arctic numerical weather prediction system, ***Q.J.R. Meteorol. Soc.*** https://doi.org/10.1002/qj.4018.
- Wang Z Q and R Randriamampianina (2021): The Impact of Assimilating Satellite Radiance Observations in the Copernicus European Regional ReAnalysis (CERRA). ***Remote Sens.*** 2021, 13(3), 426; https://doi.org/10.3390/rs13030426.
- Batrak, Y. (2021). Implementation of an adaptive bias-aware extended Kalman filter for sea-ice data assimilation in the HARMONIE-AROME numerical weather prediction system. ***Journal of Advances in Modeling Earth Systems***, 13, e2021MS002533. https://doi.org/10.1029/2021MS002533

NEWS

Projects (ongoing)

- **ZAMG (Florian Meier)**
  - **TRain**: assimilation of ZTD on trains (Florian Weidle) with technical university Vienna (including small part on sub-hourly assimilation)
  - **Link-it**: assimilation of microwave links using LHN or 1D-3D Lopez software (Phillip Scheffknecht) with ST-Pölten university and Drei Hutchison
  - **Same-AT**: Assimilation of Sentinel-1 radar delays in CLAEF with Johaneum Research Graz (just started)
  - **Achilles**: Assimilation of Sentinel-1 radar delay derived total water vapour maps in AROME with (EOG; just started)
  - **WINDSOR**: Assimilation of SCADA data (wind farms) in AROME-RUC - ends soon
  - **RAWAG** (ZAMG only): initialisation of hydrometeors from radar
- **SMHI (Susanna Hagelin)**
  - **qCONDOR** (Jelena Bjarova) on the use of 4DVar and EnsVar in nowcasting
  - Project on QC for private weather stations (Paulo Medeiros)
  - **Aeolus**: Use of Aeolus wind profiles in Harmonie-Arome
  - **CERRA**: Copernicus European Regional ReAnalysis
  - **CARRA**: Copernicus Arctic Regional ReAnalysis
  - **Profil**: use MUSC 1D profiles for aviation application (Magnus Lindskog)
- **IPMA (Maria Monteiro)**
  - **MIDAS** (EUMETSAT): https://www.eumetsat.int/MIDAS
  - **DAsKIT**
- **RMI (Alex Deckmyn)**
  - **Full DA suite**: with Radar, GNSS, Amdar, Temp, mode-S for our Arome and Alaro models
  - **DAsKIT - NodeRunner**: (relatively) easy scripting system to implement DA suites
- **MET Norway (Roger Randriamampianina)**
  - **Alertness**: Improving the use of obs in the Arctic (Supermodding/footprint operator; all-sky radiance; assimilation of sea ice temperature, ...)
  - **ARCTIC-Passion**: OSSE with satellite observations in the Arctic
  - **ESA/CYMS hurricane**: assimilation of SAR wind observations in extreme weather and polar low conditions
  - **H2O:** Hydrology to operation

Thank you for your attention!

Photo: R. Randriamampianina; Ås, Norway