Contribution of the HIRLAM consortium to the activities related to SURFEX

Years 2017-2018

Developments:

1. Prognostic ice depth in SICE (YB)

2. OROTUR and ORORAD schemes: friction due to the subgrid orography via turbulent fluxes and radiation-orography effects, for SURFEX9 (LR, PS).

3. Modifications to run FLake, for SURFEX9 (EK).

4. Modifications of ECOCLIMAP II, to run FLake and over Iceland (EK, BP). Using of the local tree height data over Scandinavia (PS, MH, MatH).

5. Adjusting of Explicit snow scheme to run over glaciers (KPN, EG, BP).

6. Ingesting of the glacier albedo from observations (KPN, PS, BP, MH).

7. Using of SoilGrids (MatH, LR, EK) dataset and local soil data for Iceland and Denmark (BP, KPN).

8. Bugs found in EKF/SODA for the ISBA DIF scheme (ÅB).

9. Towards EnEKF and coupled DA … (TL)

Testing, evaluation, applications:

1. It was decided in the meeting in Trømse in spring 2018 to stop testing of EKF/SODA in NWP mode for the ISBA FR scheme, due to too large elements of Jacobian matrix (JB, ML), and move to ISBA DIF scheme. Testing of EKF/SODA in NWP mode for the ISBA

DIF scheme is ongoing, with different control vectors and 2 patches (ÅB).

2. Testing of different options in SURFEX (ISBA DIF, ECOCLIMAP SG) for Iberian domain and Irish domain in climate mode (SV and EG). Using different obs datasets for verification.

3. Evaluation of ECOCLIMAP SG over the Netherlands, MetCoOp (Fennoscandia) and Iberian domains (JV). Attention is paid on sea/water/urban fractions, LAI and tree height. No comparison with local observations, only between ECOCLIMAP II and ECOCLIMAP SG and "common knowledge". Overall impression is positive, but more evaluations are welcome.

4. Harmonie Cy43h is under testing for the MetCoOp (Fennoscandia) and Iberian domains. It includes using of ISBA DIF and ES (MH) and OROTUR and SoilGrids dataset (LR).

5. Testing of the new albedo for glaciers, in the frames of CARRA project (KPN).

6. Testing of the maximum Richardson number option for the stable boundary layer (MH)

Transverse topics, topics to discuss:

1. Updates of physiography fields.
   - not creating artificial borders;
   - version control system?
2. How to harmonize testing of EKF?
3. How to organize SODA, to include other tiles than nature? Lakes, sea ice, urban? How to redistribute the innovations coming from the horizontal analysis between tiles and patches?

Extra topic:

Connection between SURFEX and horizontal surface analysis (OI with CANARI or smth. else). It is mostly important for snow DA, since inconsistency in physiography between SURFEX and horizontal surface analysis (e.g. CANARI) may lead to large errors in the snow analysis fields.

Also, it is connected with the assimilation of brightness temperatures from microwave for the SWE, as well as of albedo observations from remote sensing. The related COST Action ES1404 Harmosnow finished in autumn, 2018 – good example of coordination in this topic. At the moment, testing of CryoClim and H SAF data on SE is ongoing in the frames of CARRA project (MH, EK, LR). Action to provide the consistency between CANARI and SURFEX physiography, as well as observation operators for snow in CANARI is ongoing (EK). Gridpp and Titan, which are the alternative to CANARI software for the horizontal analysis, are proposed to use in Harmonie system (TA).

People:

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