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# COSMO WG3b: Highlights

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# WG3b highlights

## Summary of WG3b activities and links to related documents

<http://www.cosmo-model.org/content/tasks/workGroups/wg3b/default.htm>

→ Help maintain the information up-to-date by  
(actively!) sending feedback and corrections  
to the WG3b coordinator

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# WG3b – TERRA news (1/3)

- **New unified COSMO / ICON TERRA with COSMO v5.05**
  - *delay due to unexpected bad results from NWP test suite*
  - *bad scores due to soil drying in summer in some regions*
  - *hidden effect in ICON-EU due to active soil moisture analysis (!)*
  - *requires new minimal stomatal resistance map*
  - *additional validation with PT TERRA Nova & MSc Verena*
  - *more details in Juergen talk*
- **Effect of canopy layer**
  - *very significant impact on T2m daily cycle amplitude*
  - *multiple approaches, coordinated by AG TERRA @ DWD*
  - *more details in Jan-Peter talk*
- **Usage of Harmonized World Soil Database**
  - *improved information on soil texture, incl. vertical structure*
  - *work in progress (?)*

# WG3b – TERRA news (2/3)

- **Phenology**
  - *phenology model to capture inter-annual variability of vegetation cycle*
  - *significant impact on T2m on large region in spring and summer*
  - *more details in Jean-Marie talk*
- **Urban parameterization**
  - *see PT AEVUS*
- **Snow model**
  - *see PT SAINT*
- **Mire parameterization**
  - *a parameterization of mire effects developed at RHM*
  - *will be integrated in ICON*
  - *planned for COSMO v5.06*

# WG3b – TERRA news (3/3)

- **PhD project to improve TERRA for NWP**
  - *in group of Prof. Ch. Schaer / ETHZ*
  - *begin with Linda work on new formulation of soil water lower BC*  
(allow ground water build up, consider slope dependent runoff)  
(significantly reduces warm biases in climate simulations)
  - *more developments will be included...*
  - *start in January 2018*
- **Coupling with surface layer**
  - *many numerical inconsistencies recently corrected in ICON test*
  - *many open questions*
  - *see PT ConSAT4*

# WG3b – Priority tasks and projects

- **PP CALMO-MAX**, 06.2017-09.2019, A. Voudouri / HNMS  
→ *calibration of unconfined model parameters made practicable*  
→ *more details in CALMO & CALMO-MAX sessions*
- **PT AEVUS**, 09.2017-09.2018, P. Mercogliano / CIRA  
→ *urban parameterization for operational forecast*  
→ *more details in Massimo talk*
- **PT SAINT**, 07.2017-06.2019, S. Bellaire / SLF  
→ *multi-layers snow model for operational forecast*  
→ *more details in Sascha talk*
- **PT TERRA Nova**, 09.2016-06.2018, Y. Ziv / IMS  
**MsC Verena**, 10.2017-04.2018, V. Bessenbacher / ETHZ  
→ *document TERRA performance, compare with CLM performance*  
→ *more details in Yiftach and Verena talks*

# WG3b – Software

- **EXTPAR**
  - COSMO software for generation of external parameters
  - more details in Jean-Marie talk
- **TERRA standalone**
  - standalone TERRA module, based on COSMO v5.03
  - maintained by IMS (best effort)
  - code and documentation available on COSMO site
- **CALMO meta-model**
  - MatLab software to fit and apply the meta-model
  - further developments expected in PP CALMO-MAX
  - code and documentation available on COSMO site

# WG3b – Some critical aspects

- **Status of TERRA code**
  - clean code help streamline development and avoid bugs
  - clean code is a pre-requisite for sharing development effort
  - *time for a re-write?*
- **Status of development resources for soil & surface layer**
  - COSMO SP: further develop TERRA, do not use a community model
  - growing importance of soil & surface for high resolution applications
  - *how many educated resources do we currently have?*
- **Further development of surface analysis**
  - in particular snow pack analysis for new snow model
  - *workshop with WG1 & DWD ?*
- **New PP combining PhD @ C.Schaer / phenology / canopy ...**
  - possible interest of Prof. S. Seneviratne (maybe another PhD)
  - including CALMO calibration
  - *meaningfull?*

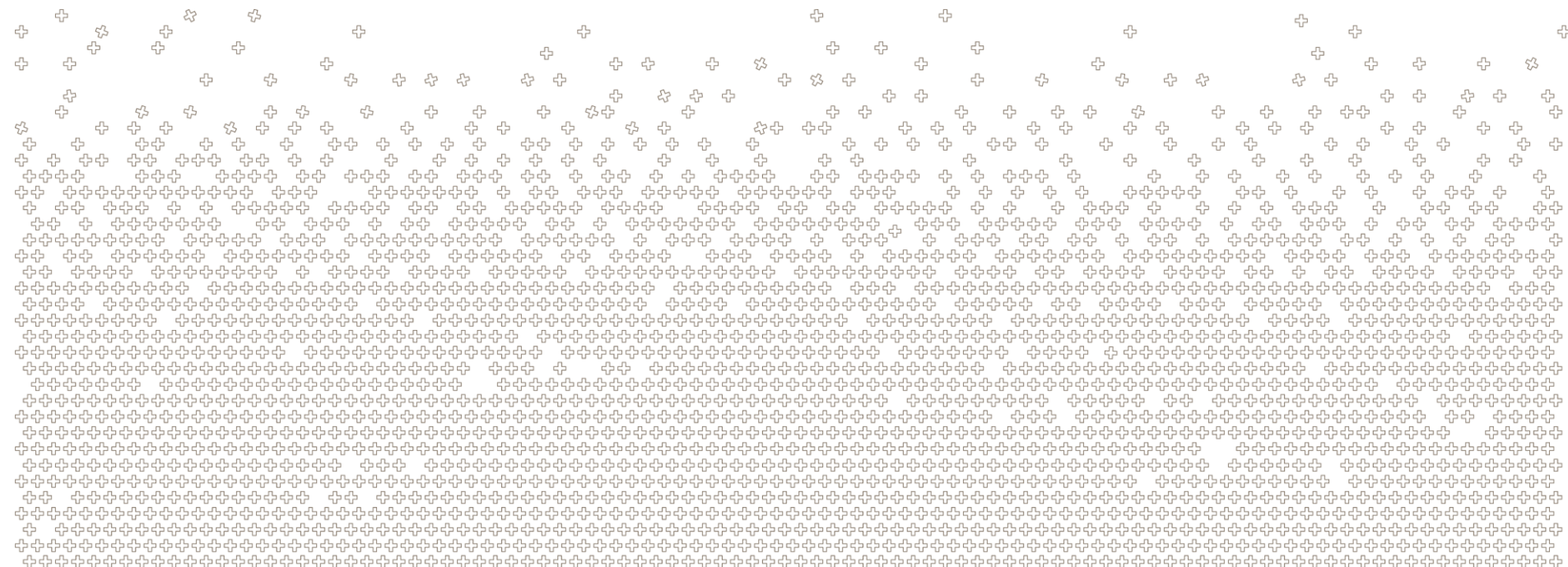




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# EXTPAR



# EXTPAR

- The **official source code** is available in a private repository in the C2SM organization on GitHub  
<https://github.com/C2SM-RCM/extpar>
- In its March 2017 meeting the COSMO StC has nominated **Katie Osterried**, working at ETHZ for C2SM, as **Source Code Administrator**
- Currently **different versions of the code** exist at DWD and at MPI
- Currently **GRIB output is not working correctly** (but NetCDF is ok)
- A **meeting** was organized **at Offenbach** on 2017 June 27 to discuss the current situation (draft minutes on COSMO web)  
<http://www.cosmo-model.org/content/tasks/workGroups/wg3b/docs/EXTPAR%20meeting%20201706.pdf>

# EXTPAR

*Latest COSMO release (version 4.0, 29.09.2016, on GitHub)*

- Support for the **MACv2 aerosol climatology** split into spectral bands, as developed by RosHyMet
- Optional creation of subgrid-scale slope parameters needed for the new **runoff formulation** developed by Linda Schlemmer
- **Corrects** a sign bug in the calculation of the THETA parameter used in **SSO** parameterization as reported by R. Zentek and J. Helmert
- Includes changes suggested By B. Rockel regarding the correct raw data set declaration for AHF and ISA fields used in **TERRA\_URB**

# EXTPAR

## *Next milestones (end 2017)*

- Code synchronization with DWD and CLM community, **unified version** on GitHub
- **Test installation** at CSCS, incl. all raw data
- Improve **documentation** on COSMO web, incl. software access
- Review support of **GRIB output**  
(remove GRIB 1 support? correct or remove GRIB 2 support?)

→ Probable delay due to illness of Katie

# Thank you for your attention!