

Final Preport for Project **1140**

Project title: **WRF simulations across scales (WRFSIM)**

Principal investigator: **Thomas Schwitalla**

Report period: **Jan. 1, 2020 - Dec. 31, 2020**

Within the WRFSIM data project, the following data sets related to publications or PhD thesis have been archived in LTA-Doku:

- 1) *LES Budgets SABLE AMMER*: Adam, Stephan; Schwitalla, Thomas (2020). *Terrestrial and Atmospheric Budgets at LES Scale*.  
[http://cera-www.dkrz.de/WDCC/ui/Compact.jsp?acronym=DKRZ\\_LTA\\_1140\\_ds00004](http://cera-www.dkrz.de/WDCC/ui/Compact.jsp?acronym=DKRZ_LTA_1140_ds00004).  
*PhD Thesis of Stefan Adam*
- 2) *High-resolution midlatitude-belt simulations for summer 2013*: Schwitalla, Thomas; Bauer, Hans-Stefan; Wulfmeyer, Volker; Warrach-Sagi, Kirsten.  
[https://cera-www.dkrz.de/WDCC/ui/cersearch/entry?acronym=DKRZ\\_LTA\\_1140\\_ds00002](https://cera-www.dkrz.de/WDCC/ui/cersearch/entry?acronym=DKRZ_LTA_1140_ds00002).  
*Schwitalla, T., H.-S. Bauer, V. Wulfmeyer, and K. Warrach-Sagi, 2017: Continuous high-resolution midlatitude-belt simulations for July–August 2013 with WRF. Geosci. Model Dev. 10, 2031-2055. DOI:10.5194/gmd-10-2031-2017*
- 3) *Seasonal latitude-belt simulation with WRF on the CP scale*: Schwitalla, Thomas; Warrach-Sagi, Kirsten; Wulfmeyer, Volker; Resch, Michael.  
[https://cera-www.dkrz.de/WDCC/ui/cersearch/entry?acronym=DKRZ\\_LTA\\_1140\\_ds00003](https://cera-www.dkrz.de/WDCC/ui/cersearch/entry?acronym=DKRZ_LTA_1140_ds00003).  
*Schwitalla, T., K. Warrach-Sagi, V. Wulfmeyer, and M. Resch, 2020: Near-global-scale high-resolution seasonal simulations with WRF-Noah-MP v.3.8.1. Geosci. Model. Dev. 13, 1959-1974. DOI:10.5194/gmd-13-1959-2020*
- 4) *WRF\_ENSEMBLE\_VAE*: Schwitalla, Thomas; Branch, Oliver; Wulfmeyer, Volker.  
[https://cera-www.dkrz.de/WDCC/ui/cersearch/entry?acronym=DKRZ\\_LTA\\_1140\\_ds00001](https://cera-www.dkrz.de/WDCC/ui/cersearch/entry?acronym=DKRZ_LTA_1140_ds00001).  
*Schwitalla, T., O. Branch, and V. Wulfmeyer, 2019: Sensitivity study of the planetary boundary layer and microphysical schemes to the initialization of convection over the Arabian Peninsula. Q. J. Roy. Meteor. Soc. 146(727), 846-869. DOI: 10.1002/qj.3711*
- 5) *CAOS\_WRF\_simulations*: Bauer, Hans-Stefan; Schwitalla, Thomas; Wulfmeyer, Volker; Bakhshaii, Atoossa ; Ehret, Uwe ; Neuper, Malte ; Caumont, Olivier.  
[http://cera-www.dkrz.de/WDCC/ui/Compact.jsp?acronym=DKRZ\\_LTA\\_1140\\_ds00007](http://cera-www.dkrz.de/WDCC/ui/Compact.jsp?acronym=DKRZ_LTA_1140_ds00007).  
*Bauer, H.-S., T. Schwitalla, V. Wulfmeyer, A. Bakhshaii, U. Ehret, M. Neuper, and O. Caumont, 2015: Quantitative precipitation estimation based on high-resolution numerical weather prediction and data assimilation with WRF - a performance test. Tellus A 67(1), 25047. DOI:10.3402/tellusa.v67.25047*
- 6) *HOPE\_LES\_simulations*: Hans-Stefan Bauer; Shravan Kumar Muppa; Volker Wulfmeyer; Andreas Behrendt; Kirsten Warrach-Sagi; and Florian Späth.  
[https://cera-www.dkrz.de/WDCC/ui/cersearch/entry?acronym=DKRZ\\_LTA\\_1140\\_ds00008](https://cera-www.dkrz.de/WDCC/ui/cersearch/entry?acronym=DKRZ_LTA_1140_ds00008).  
*Bauer, H.-S., S.K. Muppa, V. Wulfmeyer, A. Behrendt, K. Warrach-Sagi, and F. Späth, 2020: Multi-nested WRF simulations for studying planetary boundary layer processes on the turbulence-permitting scale in a realistic mesoscale environment. Tellus A 72(1), 1-28. DOI:10.1080/16000870.2020.1761740*
- 7) *WRF Downscaling Ethiopia*: Mori, Paolo; Schwitalla, Thomas.  
[http://cera-www.dkrz.de/WDCC/ui/Compact.jsp?acronym=DKRZ\\_LTA\\_1140\\_ds00006](http://cera-www.dkrz.de/WDCC/ui/Compact.jsp?acronym=DKRZ_LTA_1140_ds00006).  
*Mori, P., T. Schwitalla, M. Ware, K. Warrach-Sagi, and V. Wulfmeyer, 2020: Downscaling*

of seasonal ensemble forecasts to the convection-permitting scale over the Horn of Africa using the WRF model. *Int. J. Climatol.* DOI:10.1002/joc.6809

- 8) *FPS LUCAS EUR-44 UHOH ECMWF-ERAINT WRF381*: Jach, Lisa; Warrach-Sagi, Kirsten; Wulfmeyer, Volker.  
[http://cera-www.dkrz.de/WDCC/ui/Compact.jsp?acronym=DKRZ\\_LTA\\_1140\\_ds00005](http://cera-www.dkrz.de/WDCC/ui/Compact.jsp?acronym=DKRZ_LTA_1140_ds00005).

Jach, L., K. Warrach-Sagi, J. Ingwersen, E. Kaas, and V. Wulfmeyer, 2020: Land cover impacts on land-atmosphere coupling strength in climate simulations with WRF over Europe. *J. Geophys. Res-Atmos.* 125(18), 1-21. DOI:10.1029/2019JD031989

- 9) *Lidar thermodynamic data assimilated 3DVAR simulations*: Rohith Thundathil.  
[https://cera-www.dkrz.de/WDCC/ui/cerasearch/entry?acronym=DKRZ\\_LTA\\_1140\\_ds00009](https://cera-www.dkrz.de/WDCC/ui/cerasearch/entry?acronym=DKRZ_LTA_1140_ds00009)

Thundathil, R., T. Schwitalla, A. Behrendt, S. K. Muppa, S. Adam, and V. Wulfmeyer, 2020: Assimilation of lidar water vapour mixing ratio and temperature profiles into a convection-permitting model. *J. Meteorol. Soc. Jpn.* 98(4). DOI:10.2151/jmsj.2020-049

Compared to the original proposal, the data volume is less than expected due to a delayed project start and the difficult situation due to the Corona crisis.