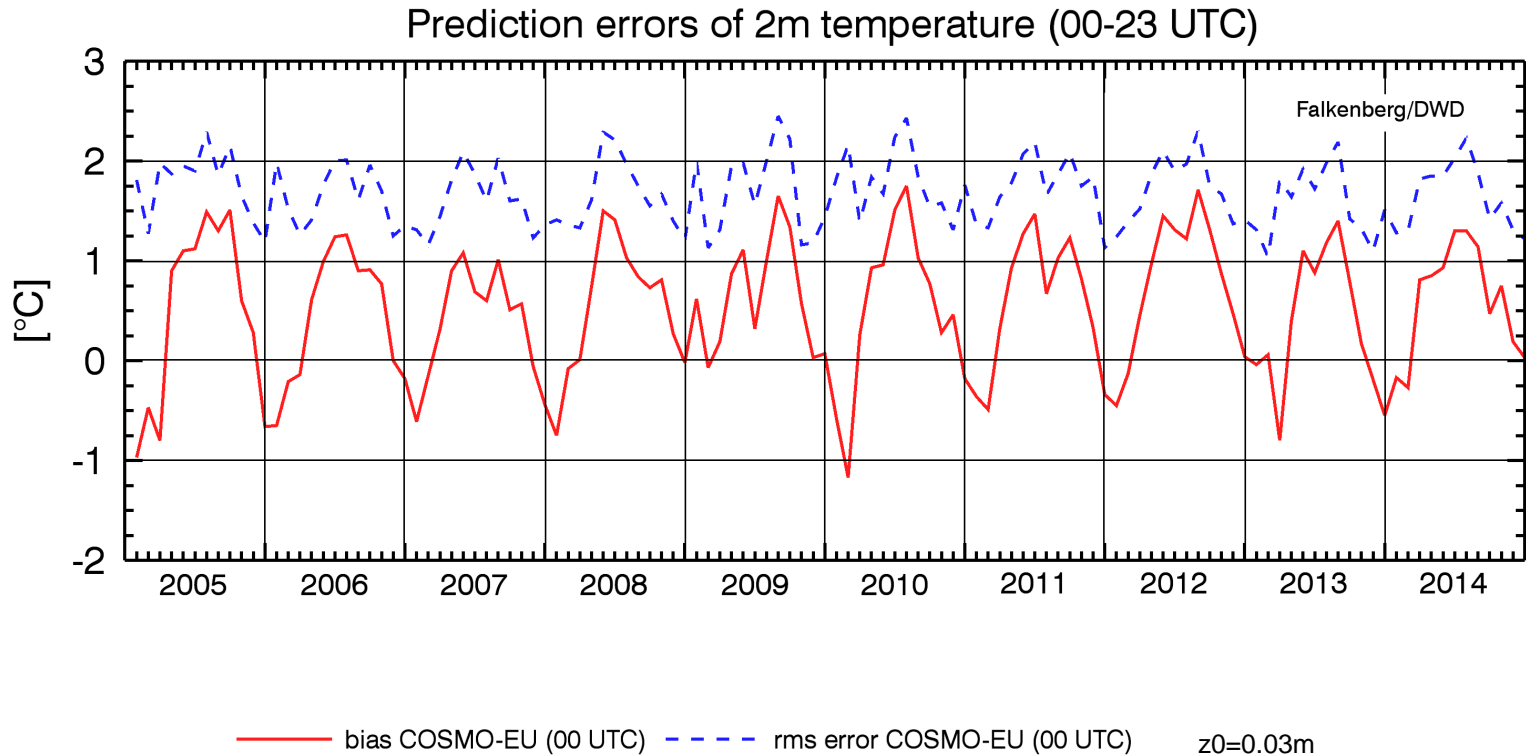
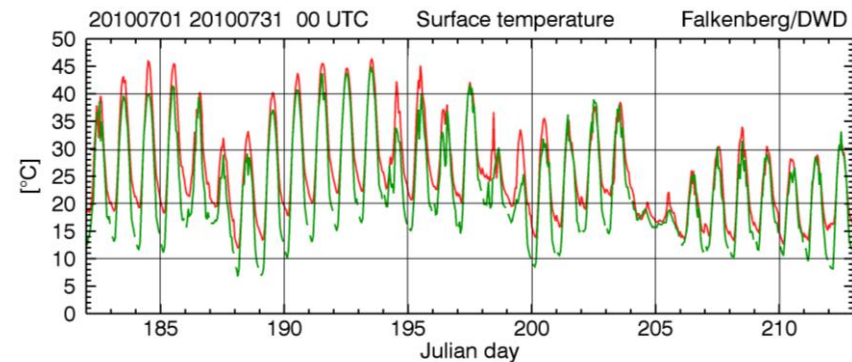
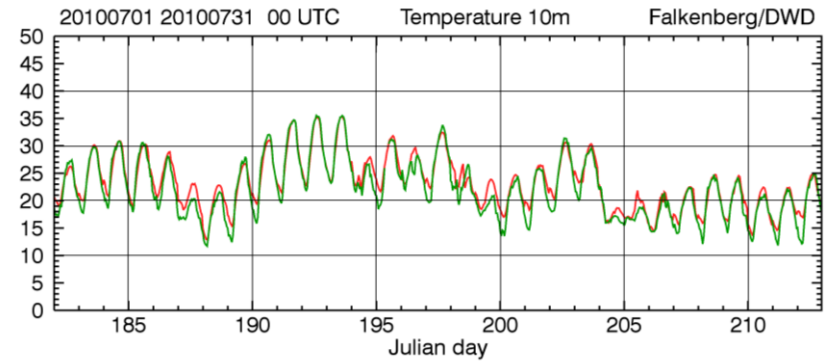
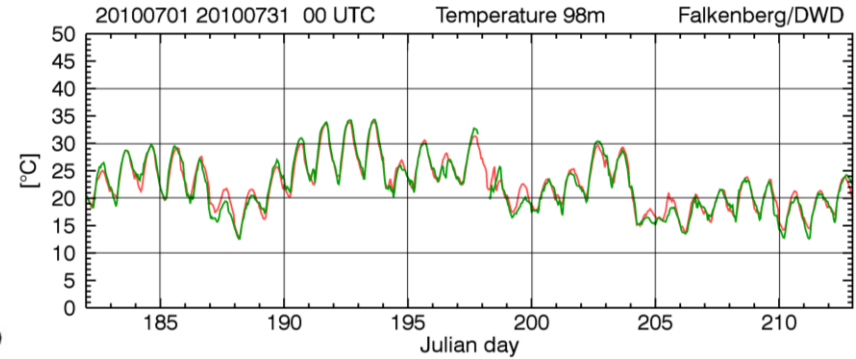
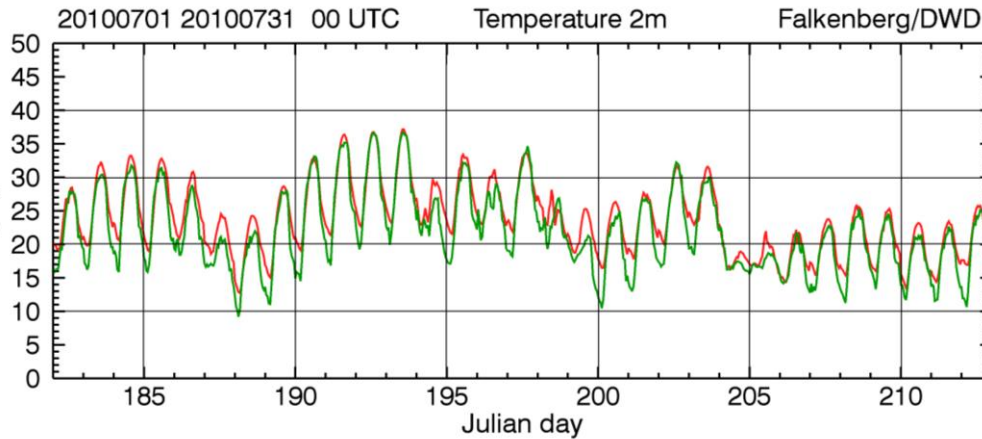


# Sensitivity studies on the impact of the vegetation layer on soil and surface temperatures at Falkenberg site

*G. Vogel, P. Shrestha and J.-P. Schulz*



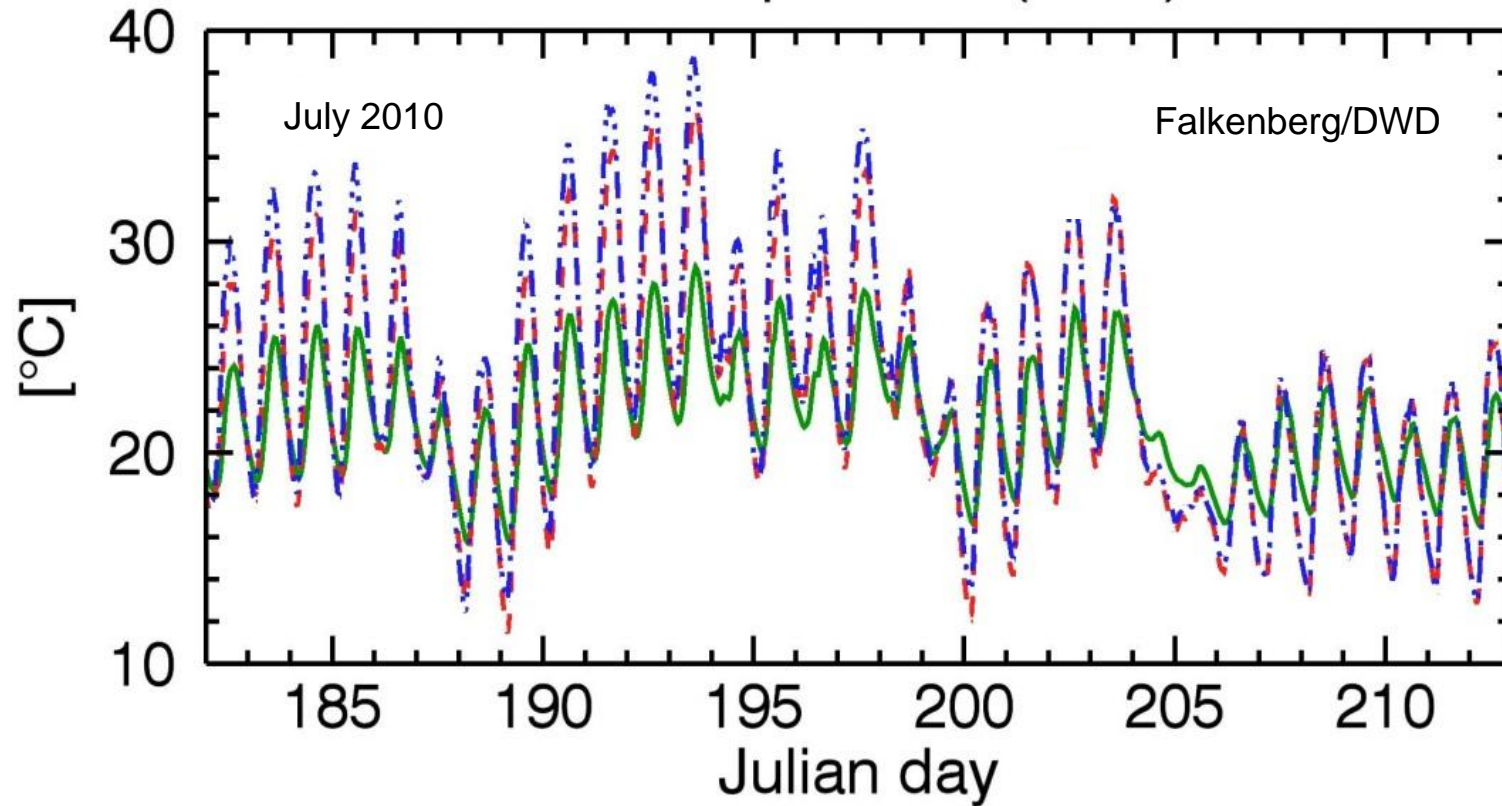
# Diagnostic 2m temperature



— Measurement — COSMO-EU



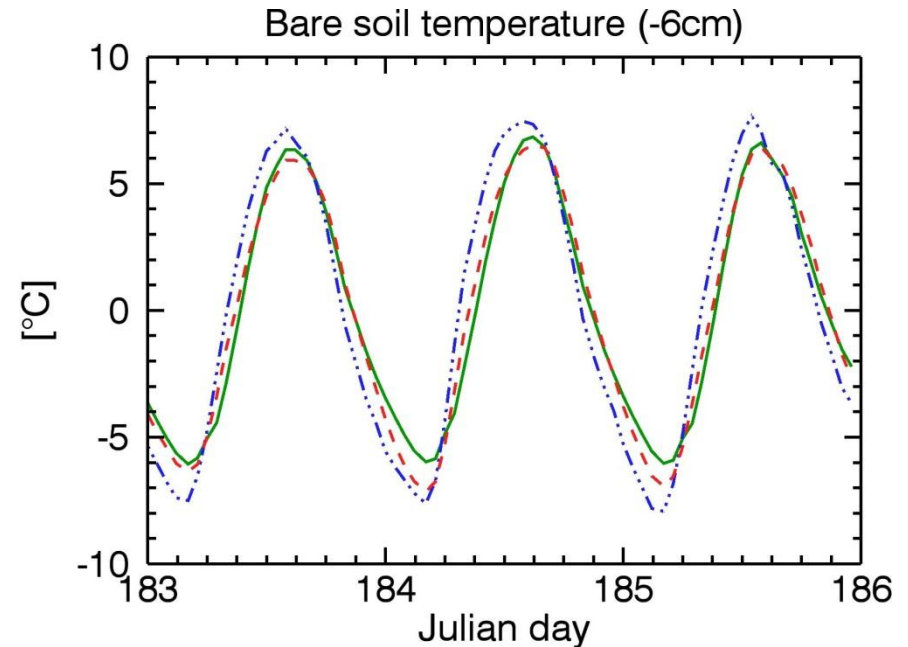
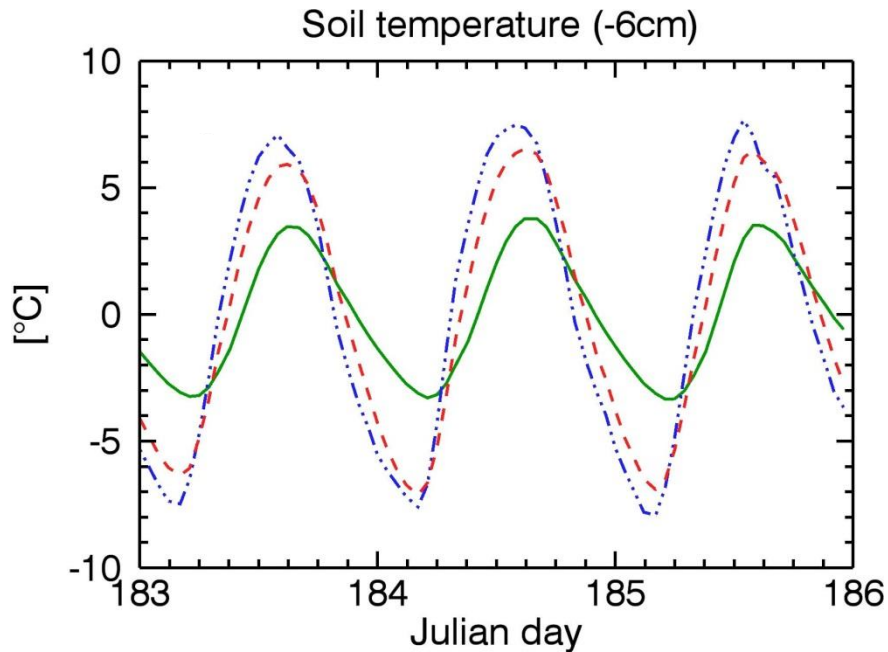
## Soil temperature (-6cm)



— Measurement    ····· Reference    - - - Johansen



## Falkenberg/DWD 02-04 July 2010

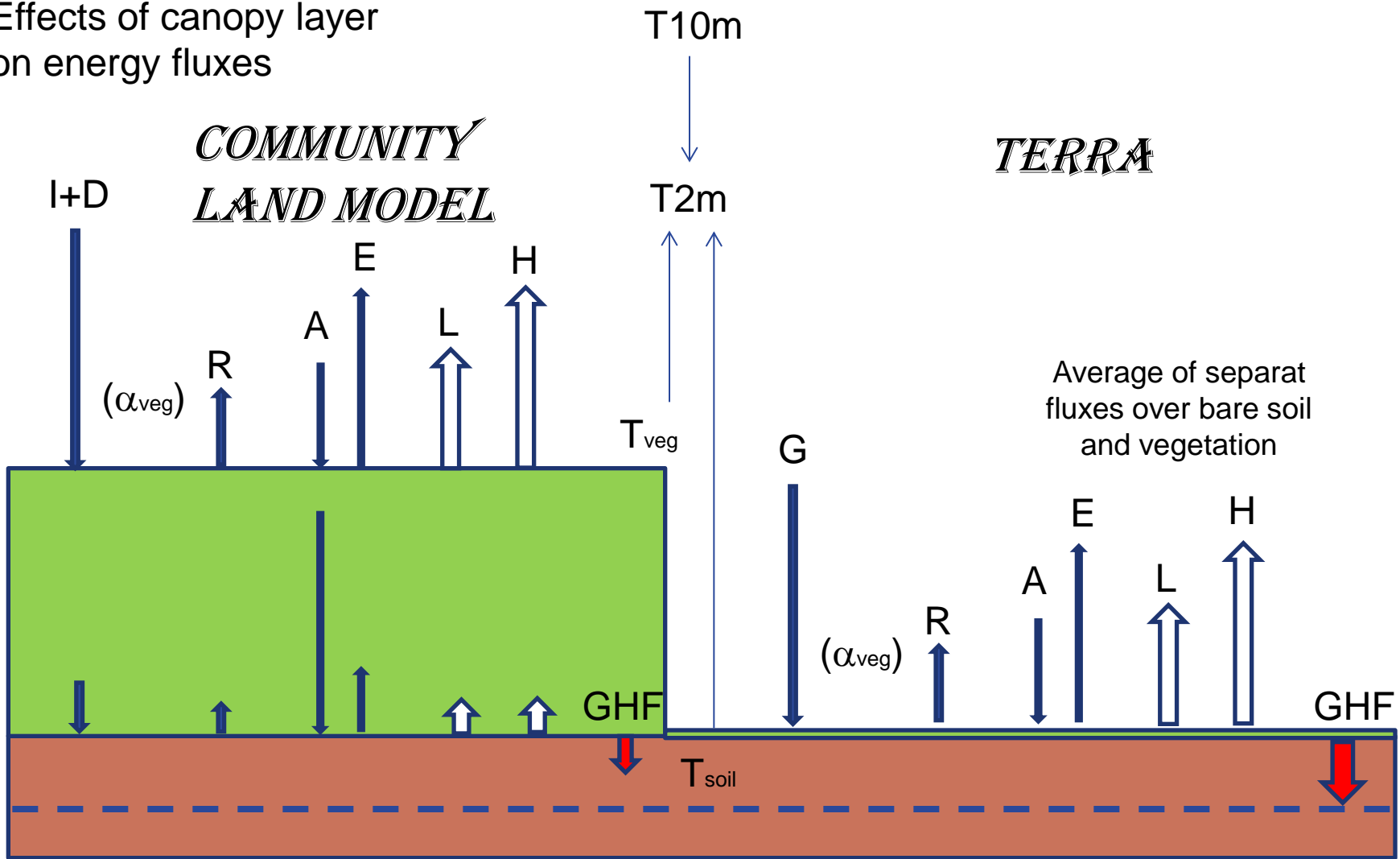


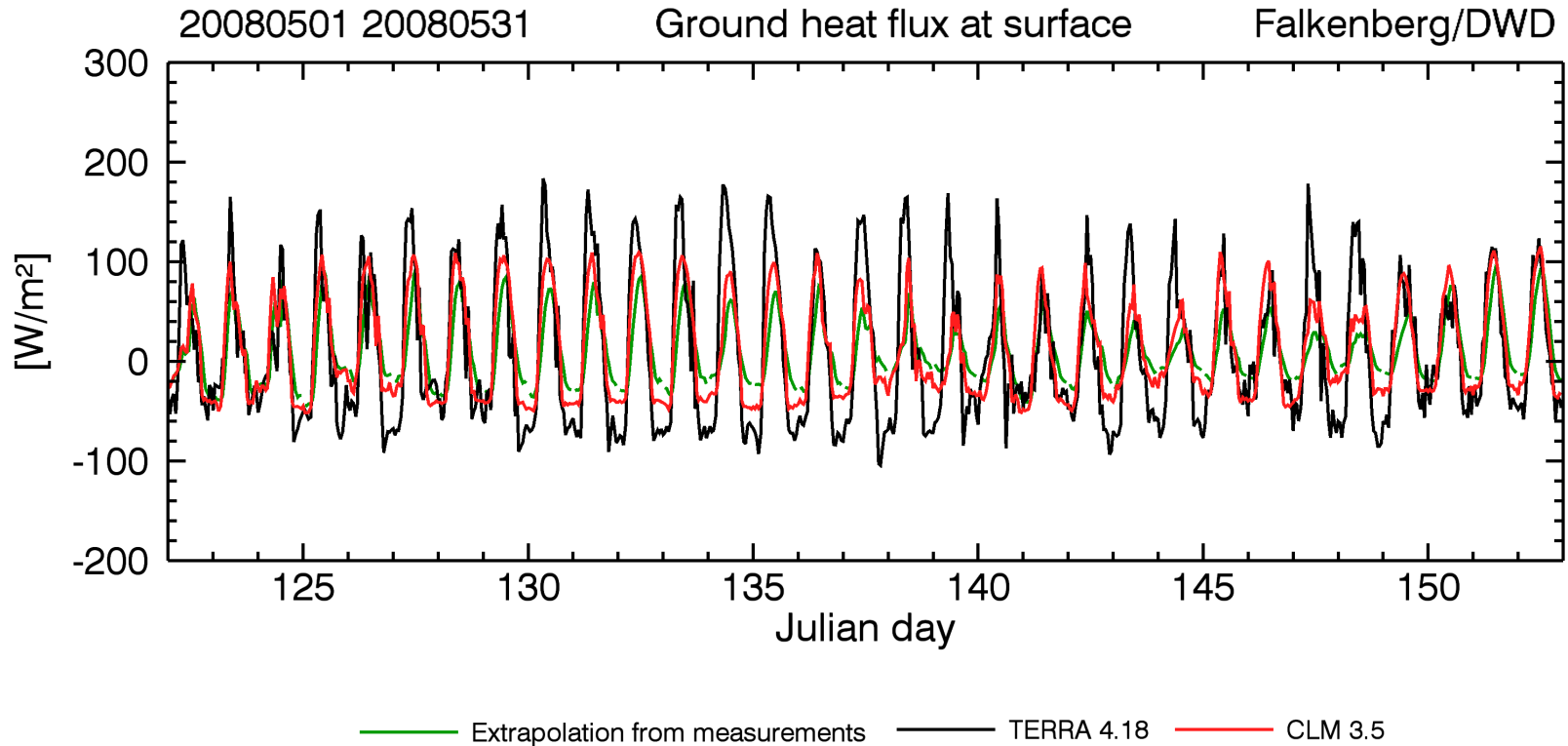
— Measurement    -·-·- Reference    - - - Johansen

Schulz, J.-P. et al.: Evaluation of the ground heat flux simulated by a multi-layer land surface scheme using high-quality observations at grass land and bare soil (submitted to MetZ.)



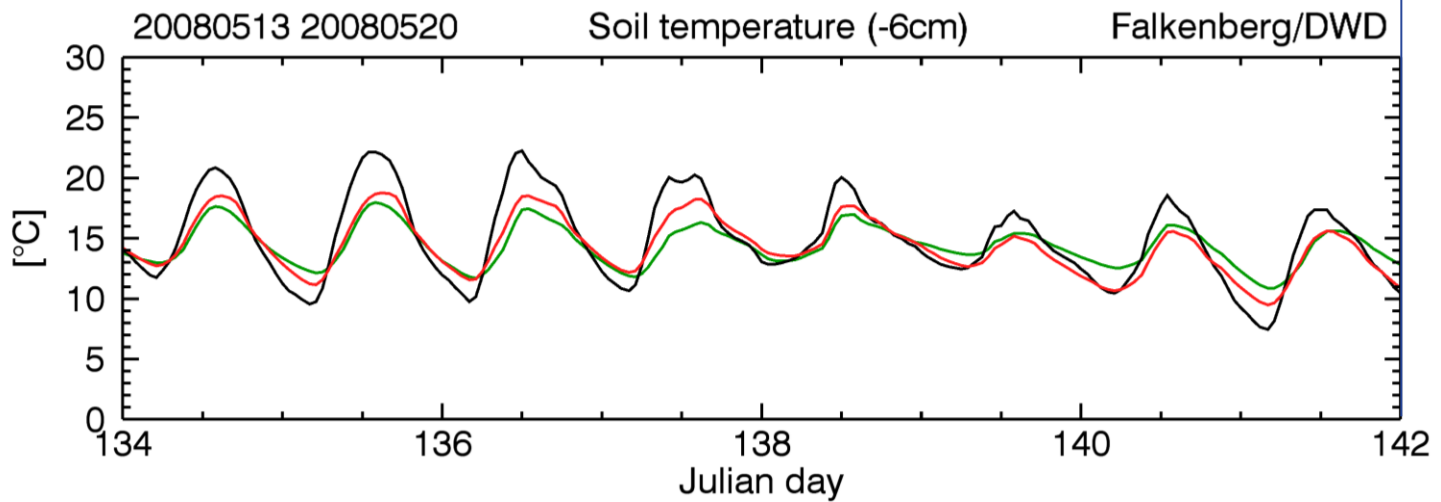
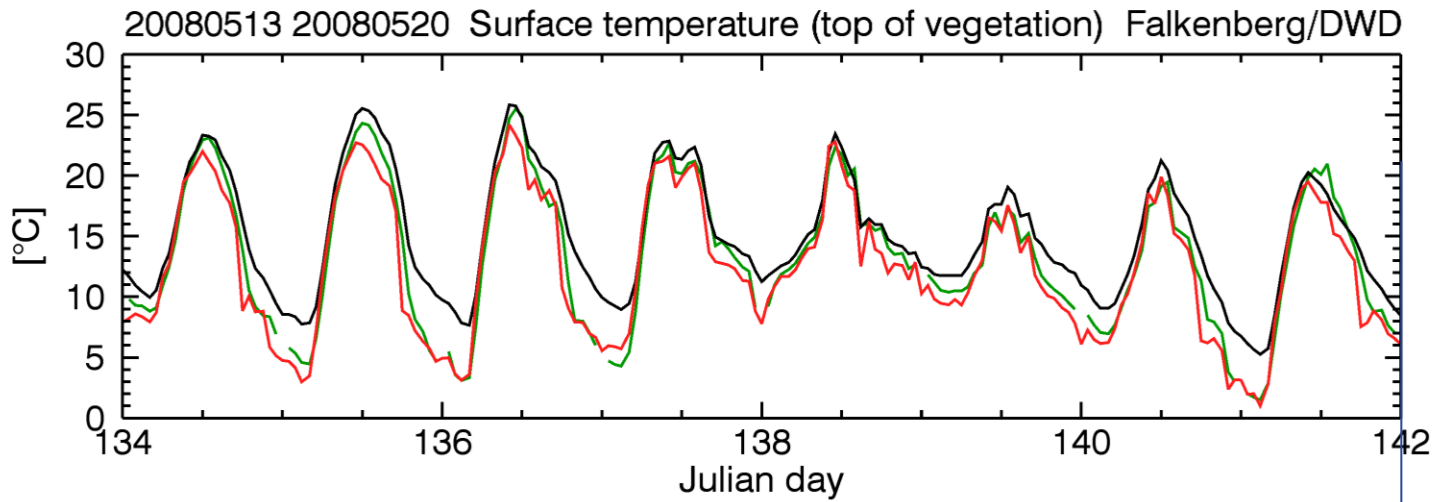
Effects of canopy layer  
on energy fluxes





Extrapolation made by Becker (2014) based on Liebenthal (2005)

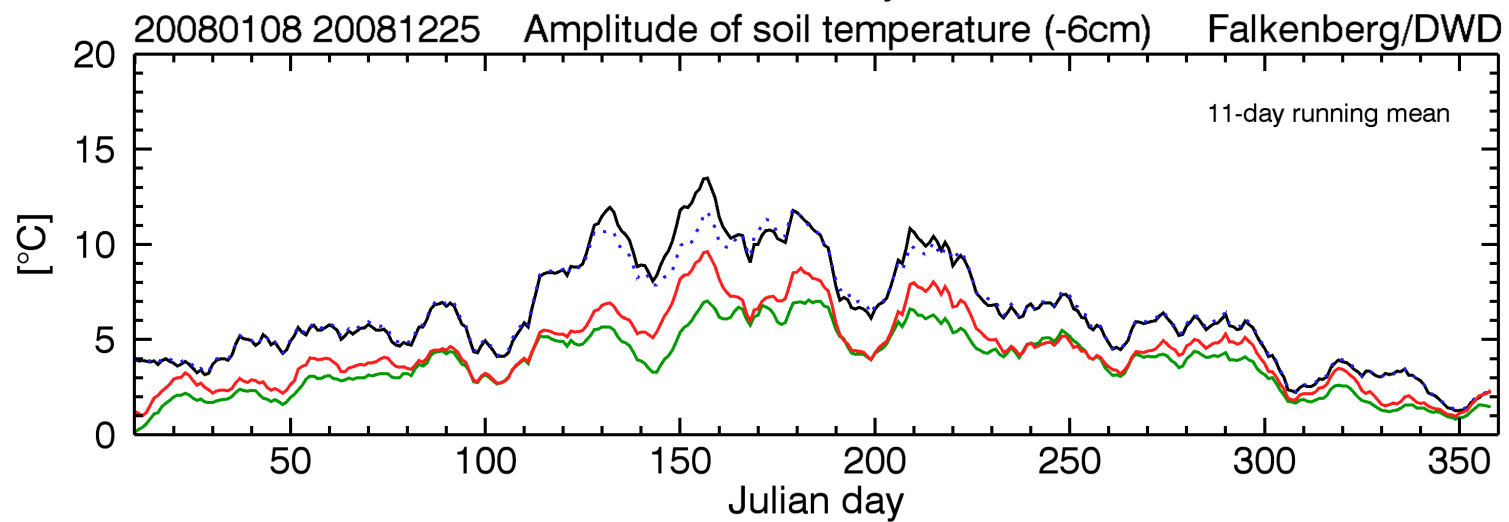
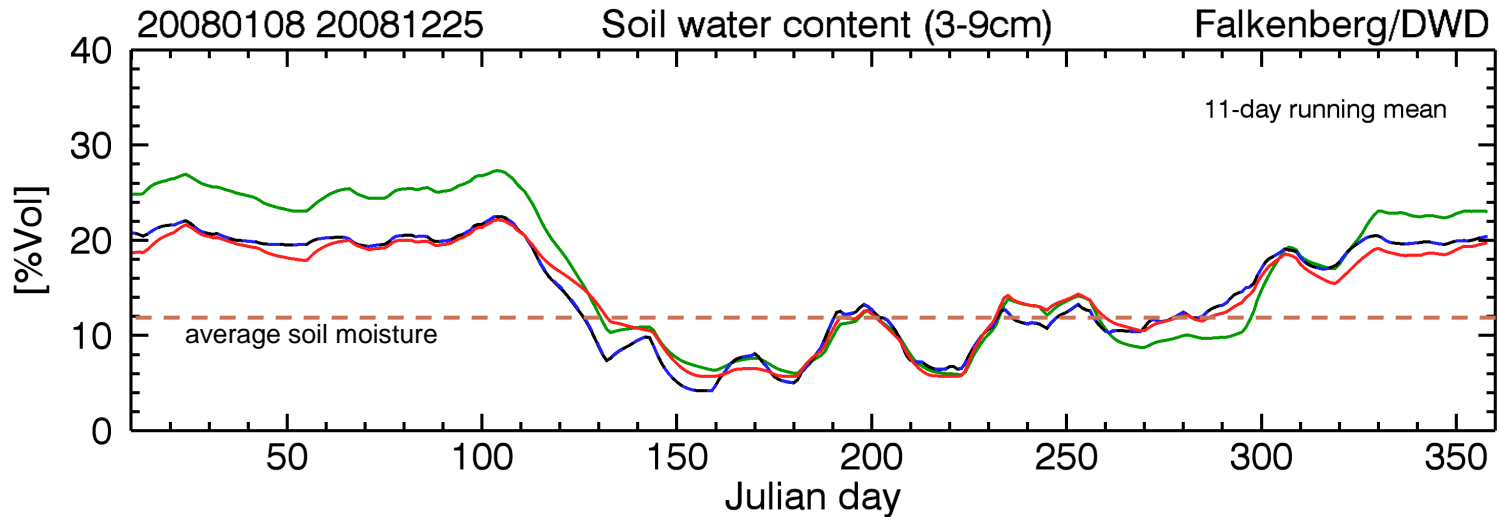




— Measurement — TERRA 4.18 — CLM 3.5



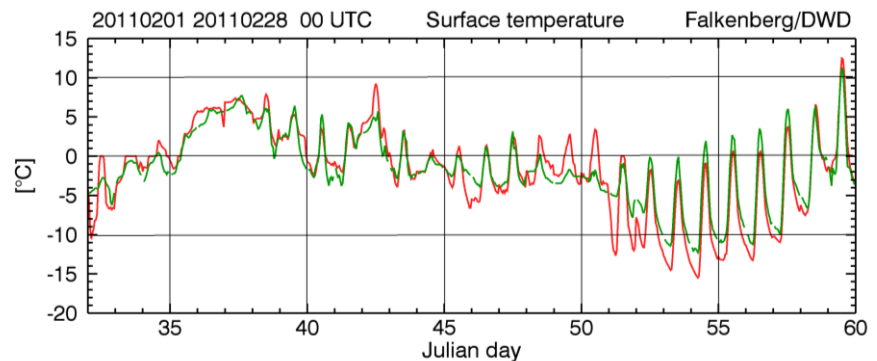
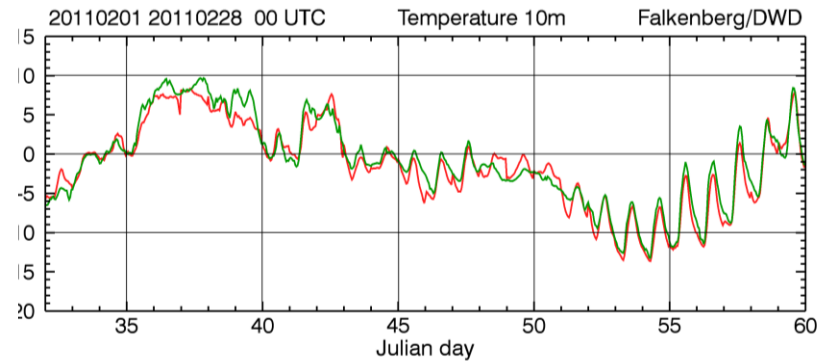
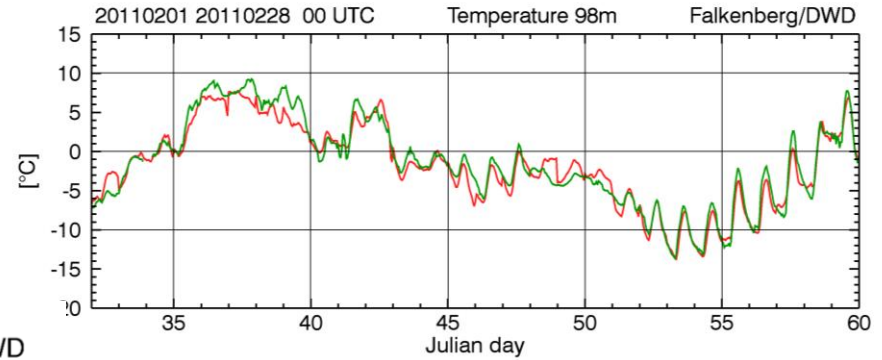
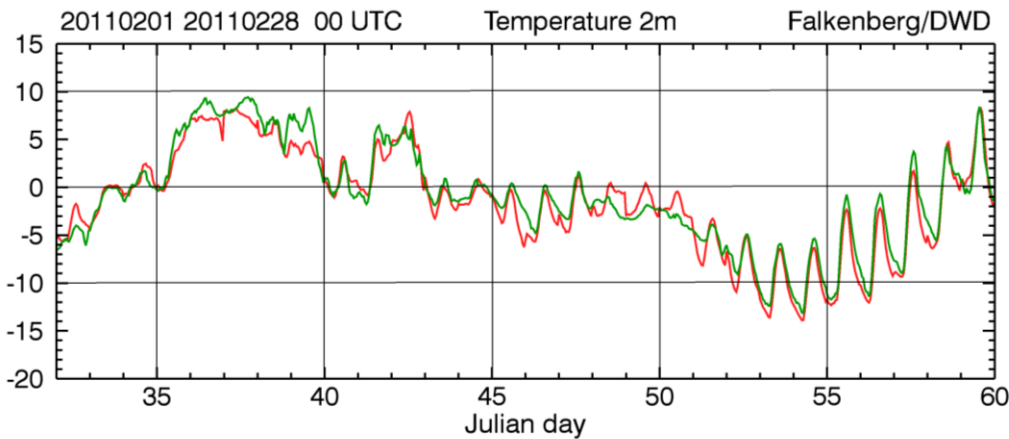




— Measurement — TERRA 4.18 (std) ..... TERRA 4.18 (Joh) — CLM 3.5

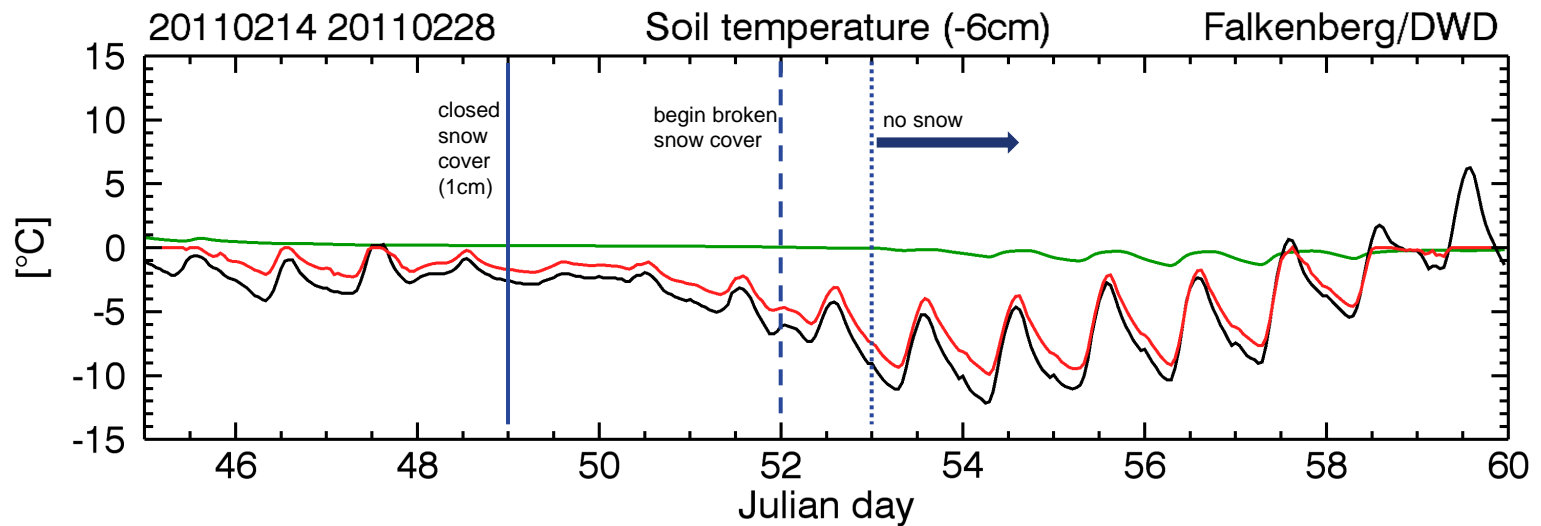
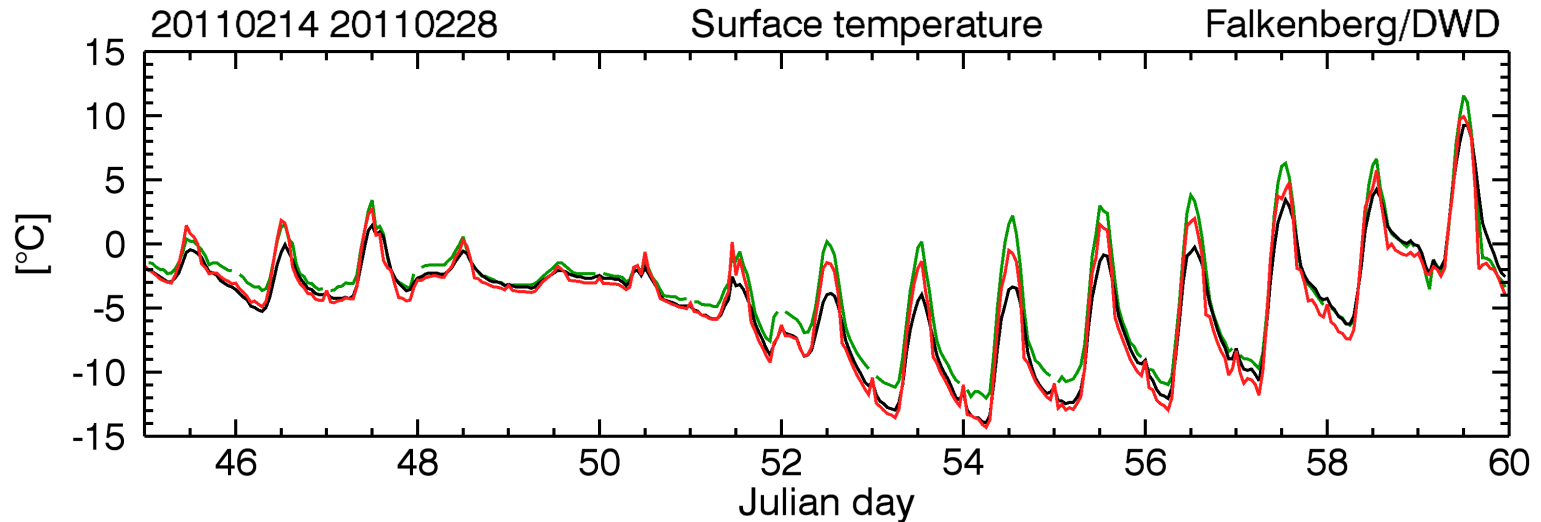


# Snow-free cold period (end of February 2011)



— Measurement — COSMO-EU





— Measurement — TERRA 4.18 — CLM 3.5



# Conclusions

The kind of representing the surface temperature has a large impact on the model accuracy of the near-surface temperature regime in the diurnal and annual cycles.

An explicit canopy temperature already provides fairly accurate morning and noon-time surface temperatures in the majority of the year.

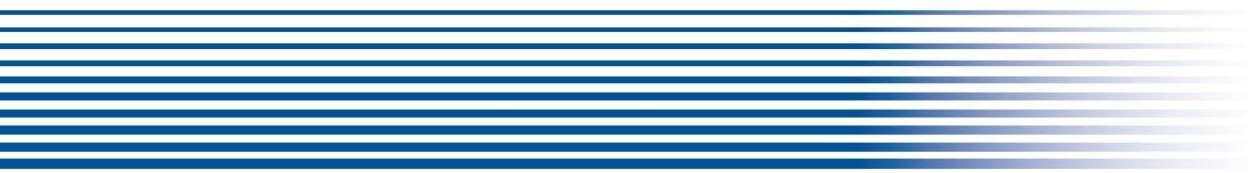
The overestimation of the diurnal amplitudes of soil temperature in the TERRA module is mainly caused by the neglected shading of the solar heating due to the vegetation cover.

A moisture-dependent soil heat conduction becomes just then to be relevant when the current soil moisture strongly deviates from its soil-type specific average.



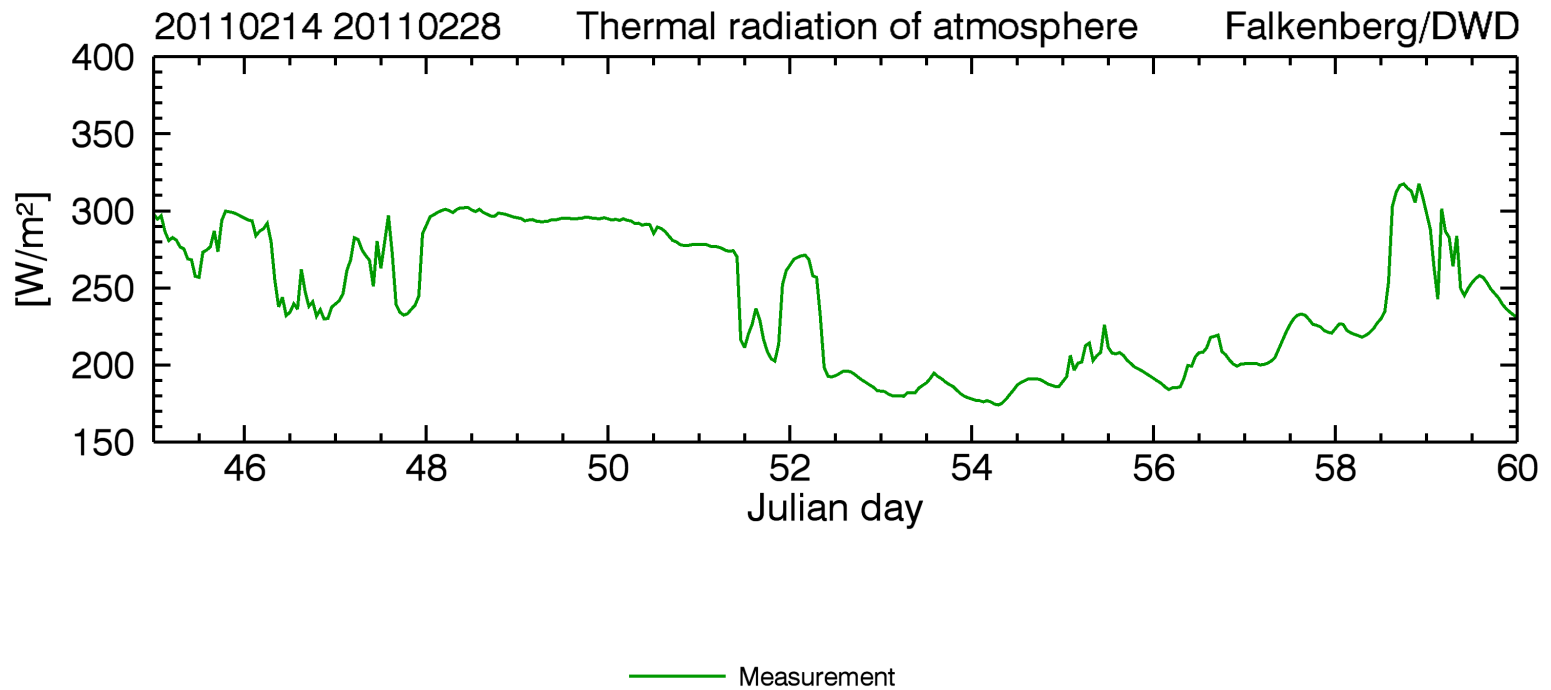
Thank you for attention!

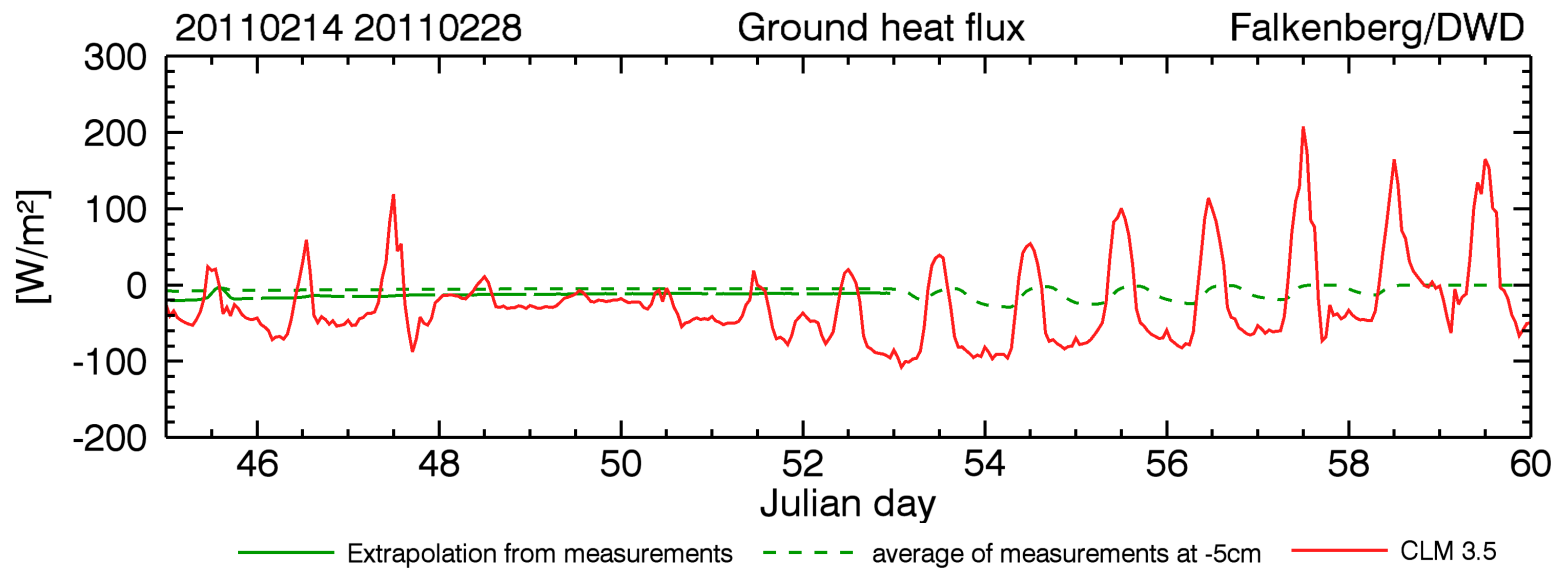
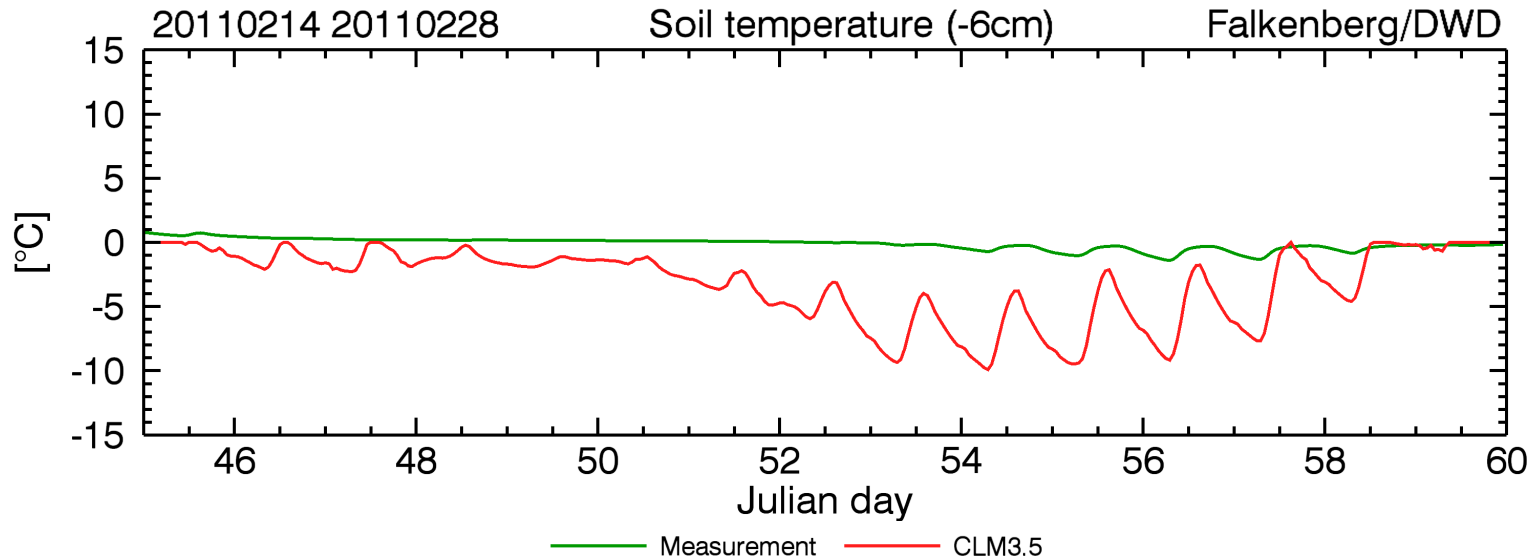




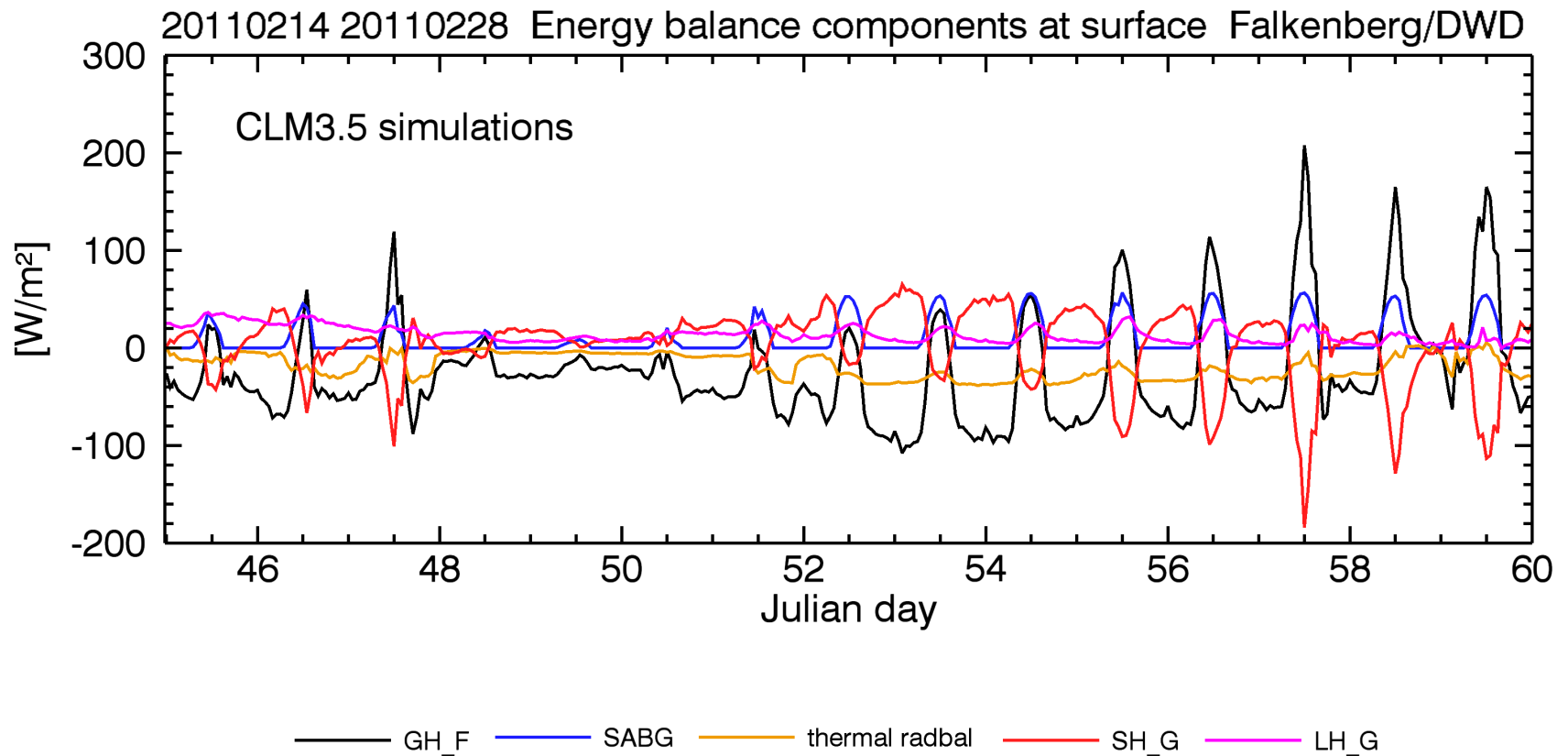
**Deutscher Wetterdienst**  
Wetter und Klima aus einer Hand





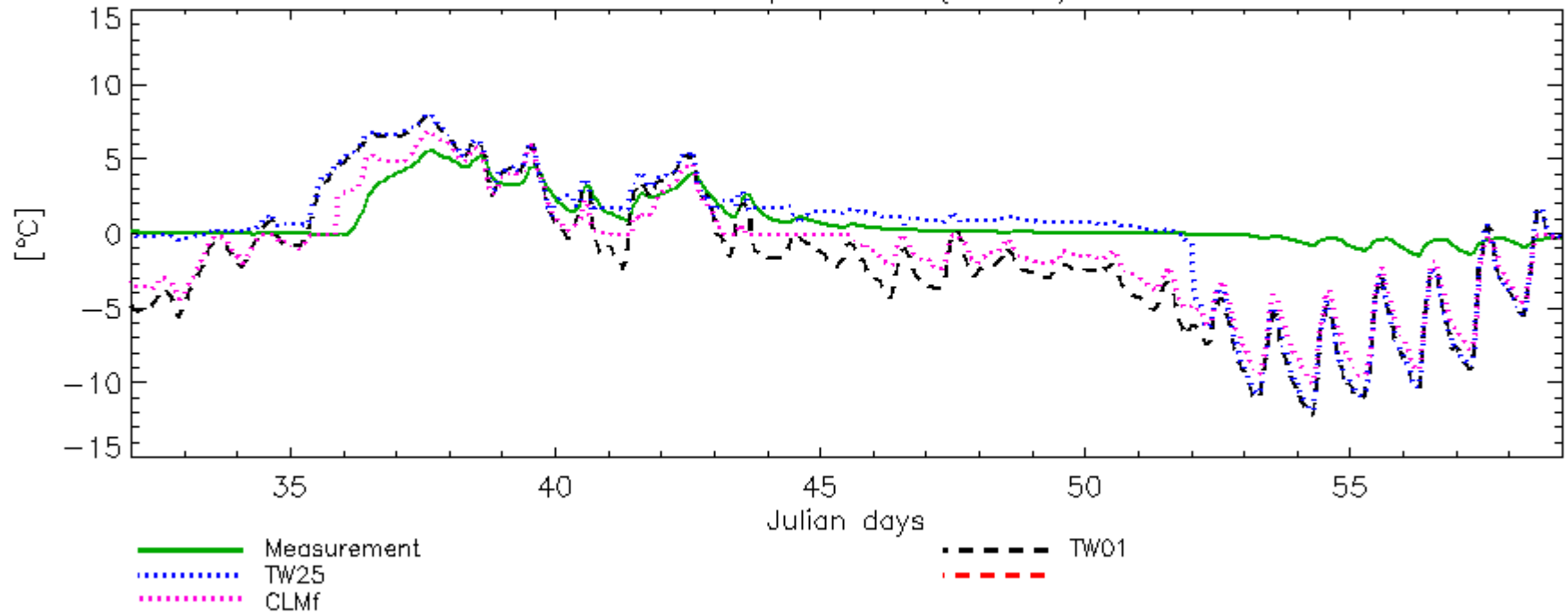






20110201 20110228 Falkenberg (52.2N, 14.1E)

### Soil temperature (-6cm)



/uhome/gvogel/clm\_runs/tool

Graphic created: Tue Feb 24 14:31:51 2015

aus: TW01TW25NN03CLMf

