Institute for Atmospheric and Climate Science

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Evaluation of COSMO-CLM² in weather mode

Master Thesis

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My thesis

- Comparison of two configurations of COSMO-7
 - COSMO-7 with newest developments of TERRA-ML (v.4.12.1)
 - COSMO-7 with CLM (v.3.5)
- Evaluation of differences



COSMO-7

- Operational configuration of MeteoSwiss
- With new aerosol climatology
- Leapfrog scheme
- Including latest COLOBOC developments in TERRA_ML

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Experimental Setup

- Time period
 - 2x 2007 (Spin-up year)
 - **2008**
- Assimilation every 6 hours
- Verification with standard package of MeteoSwiss
- Verification of surface fluxes



Temperature at 2m



Winter: Albedo, (difference in partitioning of heat fluxes) Summer: Difference of soil temperature and LW radiation budget Institute for Atmospheric and Climate Science

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Dew-point Temperature





Cloud Cover



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Verification

- Sensitive to change of land surface model:
 - Temperature
 - Dew-point temperature
 - (Wind Speed and Direction)

- Less sensitive to change of land surface model:
 - Cloud cover
 - Precipitation
 - (Pressure)

Verification of surface fluxes at specific sites

- Variables
 - Latent and sensible heat
 - Short and longwave radiation
 - Soil moisture
 - Soil temperature

- Data pool
 - SRNWP
- Locations
 - Cabauw
 - Lindenberg
 - Payerne
 - Toulouse
 - San Pietro



Surface Heat Fluxes (Example Cabauw)





Radiation (Example Cabauw)



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Albedo (Example Cabauw)



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Summary

- COSMO is sensitive to land surface model
- Surface heat fluxes better represented in CLM
- Radiation better represented in TERRA_ML
 - Surface parameter?
- No clear improvement of surface weather in COSMO
 - Tuning?