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Evaluation of the Cloud-resolving climate simulation driven by the ERA-Interim

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Experience with numerical weather prediction generally shows that increased spatial resolution, and switching from parametrized convection to cloud-resolving models, leads to a better forecast. For climate simulations, however, the potential of cloud-resolving models is not yet sufficiently investigated. Recent studies using cloud-resolving models in climate mode have shown highly promising results. Here we present a cloud-resolving simulation for a 10-year long period for the present climate. The simulation has been carried out for the period from 1998 until 2007. The real-case simulations are integrated with the COSMO-CLM (CCLM, Consortium for Small-Scale Modeling in Climate Mode). Two one way nested grids are used with horizontal resolution of 2.2 km for a cloud-resolving simulation (CCLM2) on an extended Alpine domain and of 12 km for a regional climate simulation (CCLM12) which covers Europe. The CCLM2 is driven by hourly lateral boundary conditions from the CCLM12 run while the CCLM12 run is driven by 6-hourly lateral boundary conditions from ERA-Interim reanalysis data. To eliminate spin-up issues, initial soil moisture is taken from the CCLM12 simulation which has been integrated over the 1993-2007 period. We will present evaluation results in terms of differences between the cloud-resolving simulation CCLM2 and the parametrized convection run CCLM12. Particular consideration will be given to the inter-comparison of the precipitation distributions from the two simulations over complex terrain, including an assessment of extreme precipitation events.