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Error characteristics of high resolution regional climate simulations in the Alpine Region

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This study investigates the error characteristics and error ranges of a large ensemble of high resolution regional climate models over the Alpine region. Four different regional climate models - the CCLM (community model of the German climate research), the American MM5 and WRF, and the German REMO model - are run in several configurations at a horizontal resolution of 10km. A total of 59 sensitivity simulations that cover the period from September or October 1998 to December 1999 have been performed using ERA-40 re-analysis as
p̈erfect
lateral boundary conditions. The first three/four months are used as spin up period and therefore disregarded in the analysis of the results, which leaves the full year 1999 for evaluation purposes.

The evaluation focuses on the parameters temperature and precipitation, but is also done for mean sea level pressure and the geopotential height at 500hPa for a more general view on the models performances. The major aims of this study are to demonstrate the strengths and weaknesses and suitable configurations of each model, to compare their performances, and to exploit the large model ensemble to quantify the general dynamical downscaling error of high resolution regional simulations over the Alpine area.