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Is the Climate Change Signal Resolution Dependent?

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The global general circulation models (GCMs) are the traditional tools investigating climate response due to natural and anthropogenic forcing. However their coarse resolution prevent them from reproducing many regional scale features of the present climate. Regional climate models permit a much higher resolution and have shown some skills in reproducing these features. Here we want to investigate how spatial resolution affects the simulated pattern of climate change/variability over central Europe. The global general circulation model ECHAM4 (Roeckner,1996) and the regional model REMO (Jacob,2001) have been used and following simulations have been carried out:

- past-day climate for the period from 1960 to 1990

- future climate for the period 2070-2100, assuming IPCC SRES B2 greenhouse gas concentrations(IPCC,2000)

The climate signal has been derived by the comparing past day and future climate simulations. These comparisons have been done for different model domains including the entire central Europe as well as Germany and Baltic drainage area. The horizontal resolution has been varied and included: 2.8° (ECHAM4-T42), 1.1° (ECHAM4-T106), 1° (REMO), 0.5° (REMO) and 0.16° (REMO). The analysis has been focused on 2m temperature and precipitation.

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