

# **Anthropogenic climate changes over Germany in high-resolution simulations**

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During the last decades major attempts have been made to estimate impact of human activities on climate changes. Suitable tools for these investigations are the global general circulation models (GCMs). However, their coarse resolution prevents them from reproducing many regional scale climate change features.

The main objective of this study is to investigate fine-scale climate changes under time-varying atmospheric concentrations of greenhouse gases, ozone and sulfate aerosols.

The high resolution regional model REMO was run with the spatial scale corresponds to  $0.44^\circ$  ( or 15 km). The model employs a 27 hybrid sigma-pressure coordinate system with highest resolution in the atmospheric boundary layer. Changing concentrations of greenhouse gases ( $\text{CO}_2$ ,  $\text{CH}_4$ ,  $\text{N}_2\text{O}$ ), halocarbons (CFC's) ozone and sulfate aerosols are considered as radiative forcing. Both direct and the 1<sup>st</sup> indirect (albedo) sulfate aerosol effects are taken into account. In this study several time-dependent forcing experiments have been conducted for the period 1960 to 2100. For the future concentrations of greenhouse gases, ozone and sulfate aerosols are prescribed according to the new IPCC Scenarios (A1B,A2,B1).

Analysis focuses on temperature and precipitation features over Germany.