



## Solar Influence on Future Climate

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Global warming is one of the main threats to mankind. There is growing evidence that anthropogenic greenhouse gases have become the dominant factor, however natural factors such as solar variability cannot be neglected.

Sun is a variable star; its activity varies in regular 11-years solar cycles. Longer periods of decreased solar activity are called Grand Solar Minima, which have stronger impact on terrestrial climate. Another natural factor related with solar activity are energetic particles. They can ionize neutral molecules in upper atmosphere and produce  $\text{NO}_x$  and  $\text{HO}_x$  which deplete ozone.

We investigate the effect of proposed Grand Solar Minimum in 21st and 22nd century on terrestrial climate and ozone layer. The simulations are performed with different solar forcing scenarios for period of 200 years (2000-2200) using global chemistry-climate model coupled with ocean model (SOCOL-MPIOM). We also deal with problem of representation of middle range energy electrons (30-300 keV) in the model and investigation of their influence on climate.