



## **Climate response to aerosol forcing (Vilhelm Bjerknes Medal Lecture)**

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Since the beginning of the industrial revolution, anthropogenic aerosols have influenced climate by scattering of sunlight and presumably also by the modification of cloud albedo and precipitation formation. To what extent these direct and indirect aerosol effects have masked greenhouse warming is still uncertain, because the confidence in current estimates of radiative forcings is substantially lower for aerosols than for greenhouse gases. This translates into uncertainties in the climate response at both the global and the regional scale.

In two idealized experiments with a coupled atmosphere-ocean model, the response to forcing characteristics are compared for sulfate aerosols and carbon dioxide with emphasis on the northern middle latitudes. Further, a more complex climate model is used to study the climate response to changing emissions of carbonaceous aerosols (soot), with emphasis on the lower latitudes. It is shown that the regional climate response, in both cases, is closely related to changes in the atmospheric dynamics.