



Host Model Uncertainty in Aerosol Radiative Effects: the AeroCom Prescribed Experiment and Beyond

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Anthropogenic and natural aerosol radiative effects are recognized to affect global and regional climate. Multi-model “diversity” in estimates of the aerosol radiative effect is often perceived as a measure of the uncertainty in modelling aerosol itself. However, current aerosol models vary considerably in model components relevant for the calculation of aerosol radiative forcings and feedbacks and the associated “host-model uncertainties” are generally convoluted with the actual uncertainty in aerosol modelling.

In the AeroCom Prescribed intercomparison study we systematically isolate and quantify host model uncertainties on aerosol forcing experiments through prescription of identical aerosol radiative properties in eleven participating models. Host model errors in aerosol radiative forcing are largest in regions of uncertain host model components, such as stratocumulus cloud decks or areas with poorly constrained surface albedos, such as sea ice. Our results demonstrate that host model uncertainties are an important component of aerosol forcing uncertainty that require further attention.

However, uncertainties in aerosol radiative effects also include short-term and long-term feedback processes that will be systematically explored in future intercomparison studies. Here we will present an overview of the proposals for discussion and results from early scoping studies.