

MEETING

Future Directions in Simulating Solar Geoengineering

**Fourth GeoMIP Workshop;
Paris, France, 24–25 April 2014**

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Solar geoengineering is a proposed set of technologies to temporarily alleviate some of the consequences of anthropogenic greenhouse gas emissions. The Geoengineering Model Intercomparison Project (GeoMIP) created a framework of geoengineering simulations in climate models that have been performed by modeling centers throughout the world (B. Kravitz et al., *The Geoengineering Model Intercomparison Project (GeoMIP)*, *Atmospheric Science Letters*, 12(2), 162–167, doi:10.1002/asl.316, 2011). These model simulations are being made with state-of-the-art climate models. So far they have focused on evaluating and comparing model response to globally uniform reductions in solar radiation, creation of stratospheric sulfate aerosol layers aimed at increasing planetary albedo, and injection of sea spray into the marine boundary layer aimed at increasing the reflectivity of marine stratus clouds. Analyses of GeoMIP simulations have identified robust features and key uncertainties of the modeled effects of solar geoengineering.

The fourth GeoMIP workshop was held at the Laboratoire de Météorologie Dynamique

in Paris, France, on 24–25 April 2014. The meeting had two primary scientific purposes. The first was to present new results from the set of geoengineering simulations on sea spray injection and further analyses of the original four experiments on uniform solar reduction and stratospheric aerosol injection. Analyses of these simulations indicate that differences in the microphysical representations of aerosols and in the parameterization of processes involved in carbon cycle feedbacks are the primary contributors to the differences among model simulations.

The second focus of the meeting was to discuss simulations that could be undertaken in the future, especially those that could be considered as contributions to the Coupled Model Intercomparison Project Phase 6 (CMIP6). Some of the proposed experiments are extensions and modifications of the original core experiments, and one is a new experiment evaluating cirrus cloud thinning.

A special issue of the *Journal of Geophysical Research: Atmospheres* with 15 papers on GeoMIP has been published. At the meeting, participants outlined 17 additional publication ideas, which could possibly be organized in another special issue.

The workshop included 35 members of the geoengineering scientific community from 13 countries. Results from 13 Earth system models are currently available. Continued analyses of simulated climate responses in existing models are under way, and outputs from new simulations are being made available as the model runs are completed. The official GeoMIP website (<http://climate.envsci.rutgers.edu/GeoMIP/>) discusses simulation design, existing publications, and current progress.

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