

The GeoMIP G4sea-Salt experiment and the importance of the aerosol direct effect

Lars Ahlm (1), Camilla W Stjern (2), Helene Muri (3), Ben Kravitz (4), Andy Jones (5), and Jón Egill Kristjánsson (3)

(1) Department of Meteorology, Stockholm University, Stockholm, Sweden , (2) Center for International Climate and Environmental Research—Oslo (CICERO), Oslo, Norway , (3) Department of Geosciences, University of Oslo, Oslo, Norway, (4) Pacific Northwest National Laboratory, Richland, WA, USA , (5) Met Office Hadley Centre, Exeter, UK

Marine cloud brightening through sea spray injection has been proposed as a geoengineering method to counteract global warming. The idea behind this method is to exploit the Twomey effect by which an increase in the number of cloud droplets increases the cloud albedo if the cloud water content is constant. We will show results from co-ordinated simulations with three Earth system models deploying identical sea spray climate engineering scenarios with sea salt injection rates set in each model to generate an effective radiative forcing of -2.0 W m^{-2} . We find that the cooling in all the models is obtained mainly through increased scattering of solar radiation in clear-sky conditions, suggesting a much more important role of the aerosol direct effect in sea spray geoengineering than previously thought.