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Regional Aerosol Model Intercomparison Project

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The uncertainty in aerosol radiative forcing is currently the largest source of uncertainty in estimates of the magnitude of the total anthropogenic forcing on climate, and changes in aerosol emissions are likely important for regional climate over the next few decades. This is especially the case for Africa and Asia where large aerosol emission changes are anticipated, and where aerosol has played an important role in historical changes. Uncertainty in near-term projections due to the substantial spread in aerosol (or their precursor) emissions pathways is compounded by uncertainty in the simulated response to these emissions, so a multi-model framework is needed to identify robust changes.

Several earlier studies have explored the climate response to regional aerosol perturbations, with interesting, but not always consistent, results. Using these studies to inform our understanding of the potential role of aerosol in near-future changes is not straightforward. Many are based around equilibrium experiments that are challenging to use to interpret transient simulations, and the effects of different experimental designs are difficult to separate from the effects of structural differences between the models. In Regional Aerosol MIP, we will perform a set of transient experiments based on emissions from the Shared Socioeconomic Pathways. Regional Aerosol MIP will better enable us to assess the potential contribution of aerosol to near-future climate change, to describe the robust features of the response to regional aerosol changes, and to identify where the key uncertainties lie. In this presentation we will introduce the experiment design, alongside

some early analysis.