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Whole-atmosphere aerosol-microphysics simulations of the Mt Pinatubo eruption: evaluation of simulated aerosol properties

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The Mt Pinatubo volcanic eruption in June 1991 injected 20 Tg of sulphur dioxide into the tropical stratosphere between about 21 and 28km altitude. Following chemical conversion to sulphuric acid, the stratospheric aerosol layer thickened substantially causing a strong radiative, dynamical and chemical perturbation to the Earth's atmosphere.

In this presentation we present results of simulations in the UK Chemistry and Aerosol composition-climate model (UKCA) to simulate the evolution of the stratospheric aerosol and isolate the subsquent dynamical and chemical effects from the eruption.

The UKCA model is an extension to the high-top version of the HadGEM general circulation model including a comprehensive stratospheric chemistry scheme (extended to include sulphur chemistry) and the GLOMAP-mode aerosol microphysics module.

The poster will present an evaluation of the size-resolved stratospheric aerosol properties against balloon-borne observations of size-resolved particle concentrations and satellite measurements through the Pinatubo period. Evaluation of the simulated perturbation to stratospheric ozone, via both chemical and dynamical effects will also be shown.