

## **Biomass Burning Aerosols in the Hadley Centre Earth System Model** *Ben Johnson, UK Met Office, Exeter, UK*

### Abstract

Biomass burning aerosols are one of the largest sources of aerosols globally but their radiative impacts are highly uncertain owing to huge variability in their composition, mass loading and optical properties. Whilst simple biomass burning aerosol schemes can represent the distribution of aerosol load reasonably more sophisticated models incorporating physical and chemical processes make it possible to represent the variability of aerosol properties globally requires, depending on the nature of emissions and atmospheric / chemical state into which they are emitted. The UK Met Office Hadley Centre for Climate Prediction is developing its third generation Earth System Model in partnership with the UK's Natural Environment Research Council. This includes the new UK Chemistry and Aerosol scheme (UKCA) with a modal representation for aerosols. This treats many more chemical and physical processes than ever before offering not only increased functionality but more realistic simulation of aerosol properties and processes. After giving a brief introduction to the modeling system this talk will focus on the simulation of biomass burning aerosols using new data from the South American Biomass Burning Analysis (SAMBBA), a UK-Brazil field campaign in Amazonia during September-October 2012.

## **Quantifying the Radiative Forcing from the 1991 Mount Pinatubo Eruption** *Graham Mann, University of Leeds, Leeds, UK*

### Abstract:

The Mt Pinatubo volcanic eruption in June 1991 injected between 14 and 23 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 with effects lasting several years. In this presentation we show results from model experiments to isolate the different ways the enhanced stratospheric aerosol from Pinatubo influenced the Earth's climate.

The simulations are carried out in the UK Chemistry and Aerosol composition-climate model (UKCA) which extends the high-top (to 80km) version of the HadGEM3 climate model. The HadGEM3-UKCA model uses the GLOMAP-mode aerosol microphysics module coupled with a stratospheric chemistry scheme including sulphur chemistry.

By running no-feedback and standard integrations, we separate the main radiative forcings due to aerosol-radiation interactions (i.e. the direct forcings) from those induced by dynamical changes, which alter meridional heat transport and distributions of aerosol, ozone and water vapour.

**Monday, October 6**

**10:15a.m. - Refreshments**

**10:30 a.m. - Seminar**

**FL2-1001, Small Auditorium**