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Biogenic isoprene emissions in a coupled climate-vegetation-chemistry model

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Emissions of biogenic volatile organic compounds (BVOCs) play an important role in atmospheric chemistry and climate. Isoprene is quantitatively the most important of the non-methane BVOCs (Guenther et al., 2006).

A process-based isoprene emission scheme (Arneth et al., 2007) has been implemented into the JULES land surface model. As a first step off-line isoprene simulations with JULES have been used to evaluate the model with canopy level isoprene flux measurements from different locations. Also satellite-derived isoprene emission estimates have been used to test spatial variability in modelled isoprene emission.

The same isoprene emission scheme has then been implemented into the Met Office's Earth System model HadGEM2-ES (JULES+UK Chemistry and Aerosol model, UKCA) to look at Biosphere-Atmosphere Interactions. Results from the use of our interactive isoprene emission scheme with HadGEM2-ES will be shown. We demonstrate the importance of interactive isoprene emissions to ensure consistency between emissions and meteorology which is not possible when simply prescribing emissions from a climatology.

Arneth et al., 2007, Atmos. Chem. Phys., 7, 31-53

Guenther et al. 2006, Atmos. Chem. Phys., 6, 3181-3210