



Evaluation of a process-based model for biogenic isoprene emissions

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Terrestrial vegetation plays a crucial role in the regulation of atmospheric composition and climate that goes beyond that of carbon dioxide and surface energy fluxes (Arheth et al., 2008). In particular biogenic volatile organic compounds (BVOCs) affect the lifetime of some greenhouse gases (e.g. methane, Monson & Holland, 2001), are precursors of others (e.g. ozone, Sanderson et al., 2003) and are a source of secondary organic aerosol (SOA) (Claeys et al., 2004).

Isoprene emissions represent approximately one half of the total BVOCs emissions (c.a. 1000 TgC/y, Guenther et al., 2006).

In order to identify and quantify the key feedbacks between biogenic isoprene emissions, atmospheric chemistry and climate a process-based scheme for isoprene emission (Arneth et al., 2007) will be implemented into the Met Office's earth system model HadGEM2-ES.

As a first step offline simulations of isoprene emissions have been made to evaluate the model and test its sensitivity. Local isoprene flux measurements have been used to test diurnal, seasonal and inter-annual variability of modelled isoprene emissions for different biomes. The model performs really well in reproducing isoprene emissions from different sites. So, once the isoprene scheme will be coupled with the HadGEM2-ES earth system model, it will be really useful to quantify the effects of isoprene emissions on past, present and future climate and to investigate the feedbacks between isoprene and atmospheric chemistry.

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