Project: **777**

Project title: **Evaluating the Climate and Air Quality Impacts of Short-Lived Pollutants (ECLIPSE)**

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Report period: **1.1.2019 – 31.12.2019**

The work in the reporting period builds on previous work assessing the role of aerosol emissions for climate (Baker et al., 2015), in particular focusing at the recent past and near future (Myhre et al., 2017). The focus of study in the current reporting period is to understand the influence of recent rends in aerosol emissions on aerosol-cloud-climate interactions over major source regions (Europe, North America and East Asia). As an example, Fig. 1 shows the relationship between trends in aerosol optical depth and column cloud droplet number concentration and cloud radiative effects during 2001 to 2017 period– in the recent period, for which satellite observational data are available, a clear relationship exists. This promising result may now allow to judge on the model skill in simulating these regional trends and thus may allow to conclude about aerosol-cloud-climate interactions.

In addition, ECHAM5-HAM2 aerosol-climate model (Zhang et al., 2012) simulations conducted to study the regional influence of trends in aerosol emissions on other climate-relevant observables (clouds, radiation and precipitation). Currently these simulations are analysed to assess the aerosol-cloud-climate interactions over major aerosol emission source regions.

References

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Figures

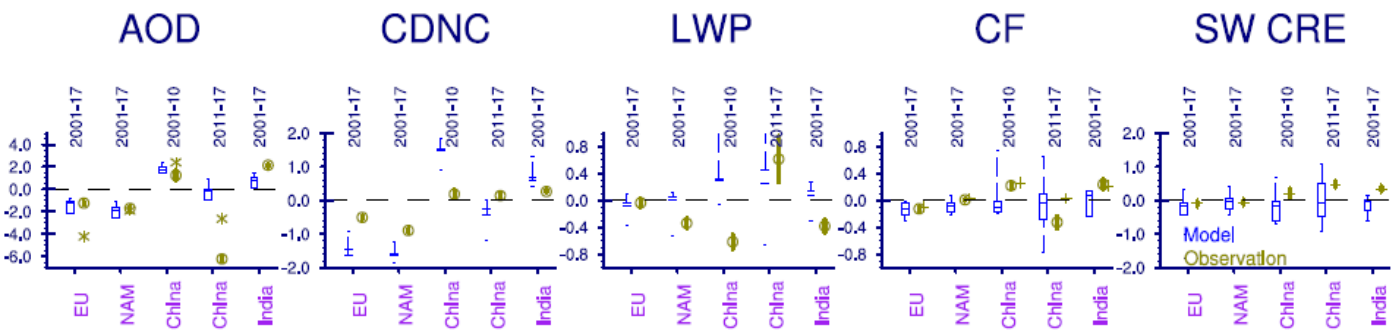

Fig. 1: Area-average linear trends (%) of aerosol optical depth (AOD), cloud droplet number concentration (CDNC), liquid water path (LWP), cloud fraction (CF) and short-wave cloud radiative effects (SW CRE) for Europe (EU); North America (NAM); China; and India. Blue indicates the data from transient coupled-model integrations and green indicates the data from satellite observations.