

Response to revised version of „Value added by high-resolution regional simulations of climate-relevant aerosol properties“ by P. Crippa, R. C. Sullivan, A. Thota, S. C. Pryor

The authors show that WRF-Chem with the physical and chemical schemes chosen for their study has substantial biases at 60 km horizontal resolution over eastern North America. The biases depend only weakly on the cumulus scheme or lateral boundary conditions. At 12 km horizontal resolution the biases to re-analysis data, in particular for precipitation, are smaller.

The intended quantification of the value added by enhanced resolution in the description of the drivers of aerosol direct radiative forcing over eastern North America cannot be achieved with the current setup as the bias in precipitation implies a bias in wet scavenging (the most important removal mechanism for aerosol particles, as mentioned in the study) and the bias in boundary layer humidity leads to biases in aerosol water uptake and therefore AOD (which is discussed in the study).

Therefore either the focus of the manuscript needs to be changed to discuss the performance of WRF-Chem at different horizontal resolutions in general or the setup needs to be changed for example by running a simulation with 36 km horizontal resolution. Only then can publication be considered.