Introduction

On August 8, 2010, derecho-type thunderstorm swept over Eastern Europe. The derecho event was accompanied by the remarkable smoke aerosol concentrations originating from the wildfires from Russia. Hindcast experiments with the numerical weather prediction model HARMONIE were performed considering the impact of wildfire smoke on the derecho event through the direct radiative effect.

Modelling methods

*) HARMONIE 37th1.1 (nonhydrostatic dynamics, AROME physics, 2.5 km horizontal resolution, 1 min timestep) resolves deep convection explicitly (Seity et al., 2011).

*) 1500°2250 km domain; centre 54.5º N, 24.5º E.

*) HIRLAM model output as boundaries.

*) Organic matter, sulphate and black carbon AOD from CTM-IFS hindcast experiments (Huijnen et al., 2012) as input for HARMONIE radiation computations.

Conclusions

HARMONIE model is able to successfully resolve derecho dynamics. Aerosol is contained on the warmer side from the polar front, along which the derecho travelled. Because of the impact through the direct radiative effect of smoke aerosol in this area, the severity of the convection is weakened.

Acknowledgements

Authors are very grateful to Dr. Vincent Huijnen for providing aerosol data (Huijnen et al., 2012) for this study. We thank Jüri Kamenik from ilm.ee and Evelin Nummert for providing photograph of the derecho in Estonia on 08 August, 2010: Modelling derecho with NWP model HARMONIE (submitted to Atmospheric Research).

References

