Project: **1300**

Project title: **urbisphere — coupling dynamic cities and climate**

Principal investigator: Swen Metzger, **Andreas Christen**

Report period: **2022-05-01 to 2023-04-30**

Activities during the current grant period

Aim of this study is to investigate the effect of different horizontal resolutions on model results, using various ERA5 nudging data, i.e., down from approximately 300 km to 25 km.

Initial results have been presented at the EMAC Symposium 2021: "On the influence of aerosol hygroscopic growth on meteorology using model data — from global to urban scales", Metzger, Swen, Feigel, Gregor, Steil, Benedikt, Rémy, Samuel, Christen, Andreas, Grimmond, Sue (*https://doi.org/10.5281/zenodo.4902248*).

TABLE: *AOD change [%] – global station mean for different experiments (see text).*

Location	Global/mixed	Global/mixed	Global/mixed	Global/mixed	Global/mixed	Global/mixed
Ref	OBS – CAMS	OBS – EMAC*	CAMS – EMAC*	Exp1 – Exp2	Exp1 – Exp3	Exp1 – Exp4
Res	60 vs 55 km	60 vs 55 km	T255 vs T255	T42 vs T42	T42 vs T42	T42 vs T42
AW	yes – no	yes – yes	no – yes	yes – no	yes – yes	yes – no
Free	N/A – no	N/A – no	no – no	no – no	no – yes	no – yes
Npoints	19237	19237	19237	22277	22277	22277
Δ [%]	-8.75	16.63	23.34	19.26	-37.90	-22.73
Europe	Urban/City	Urban/City	Urban/City	Rural/Coast	Rural/Coast	Rural/Coast
Exp	Exp1 – Exp2	Exp1 – Exp3	Exp1 – Exp4	Exp1 – Exp2	Exp1 – Exp3	Exp1 – Exp4
Npoints	773	773	773	303	303	303
Δ [%]	-31.57	30.59	9.47	-31.95	29.10	0.98

Here we build on our pre-study by repeating the simulations in an improved setup. However, due to technical difficulties, and too limited storage, we could not complete our simulations as planed.