Project: 1263Project title: ICON-LEM simulations for Paris RDPPrincipal investigator: Vera SchemannReport period: 2023-11-01 to 2024-10-31

In the reporting period, our simulation research focused on two main themes - convective rainfall events and urban heat islands. For the convective rainfall event, we continued the investigation of an example case study at July 9 and 10 in 2017 in the surrounding of Paris. The comparison of our 2km (with convection parameterization) and 600 and 300 m (without convection parameterization) simulations showed, that the higher resolution showed an overall improved representation of the observed state compared to the 2km simulation. Nevertheless, the comparison with observations still showed some biases in temperature (see Fig. 1) but also in humidty (not shown). We would like to continue the investigation by adding a few more sensitivity studies and also move forward to analyze additional observations taken during summer (Olympia 2024) in Paris.

The second focus was on urban heat islands. For practical reasons, we focused first on the rhinearea and investigated local wind systems, which could lead to cooling effects. This was due to the available observations and the option to also include additional wind measurements. The analysis was part of a Masterthesis and the work will be continued - in the rhinearea as well as for the surrounding of Paris. Not only the preliminary results, but also the modeling experience and also analysis practices will support our ongoing analysis of potential events during the summer period in the surrounding of Paris.



Figure 1: Comparison of the observed (blue) and simulated (orange, green, red) time series of the 2 m temperature, surface pressure, and precipitation rate at the SIRTA supersite from July 9 to 10, 2017, for different resolutions. The shaded area marks the spin-up time of 6 hours. The dashed line marks the occurrence of a cold pool. The time is given in UTC.