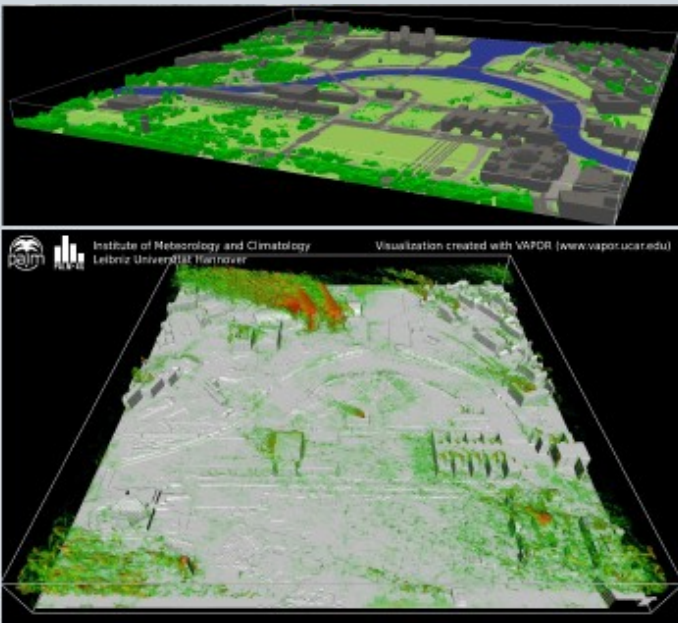


## Online seminar announcement:

# An Introduction to the PALM model system

The PALM modelling group of the Institute of Meteorology and Climatology at the Leibniz University Hannover, Germany, is offering a 5-day webinar from 21<sup>st</sup> to 25<sup>th</sup> September 2020.

The PALM model system has been continuously developed at the Institute of Meteorology and Climatology (IMUK), Leibniz Universität Hannover (LUH), Germany, since 1997. It is used to study micro- and meso-scale turbulent boundary layer flows in the atmosphere and the ocean. PALM includes a number of advanced features like topography, non-cyclic boundary conditions with turbulent inflow, an embedded Lagrangian particle model allowing explicit treatment of cloud droplet physics, a wind turbine model for simulating complete wind parks including wake effects, or an interface for adding user defined code. Recently, the model has been significantly extended in a collaborative effort of several research institutions for urban applications (PALM-4U), which includes explicit treatment of urban surfaces, chemistry, radiation, but also LES-nesting and nesting into larger scale models. Data input and output is in NetCDF format. PALM is optimised for high performance on all kind of state-of-the-art processor architectures and it scales on up to several tens of thousands of processors. PALM is free software and can be redistributed and/or modified under the terms of the GNU General Public License (v3). Download information and a detailed online documentation is available under <http://palm-model.org>.



*PALM-4U allows detailed resolution of city parts, here the government quarter in Berlin, considering all relevant urban features/processes (surface materials, vegetation, radiation,...)*

### What does the seminar cost?

The fee for participants from outside the MOSAIK/UC<sup>2</sup> project will be: € 600 for commercial companies, € 300 for educational/research institutions. This includes tuition, seminar materials and support during the hands-on sessions.

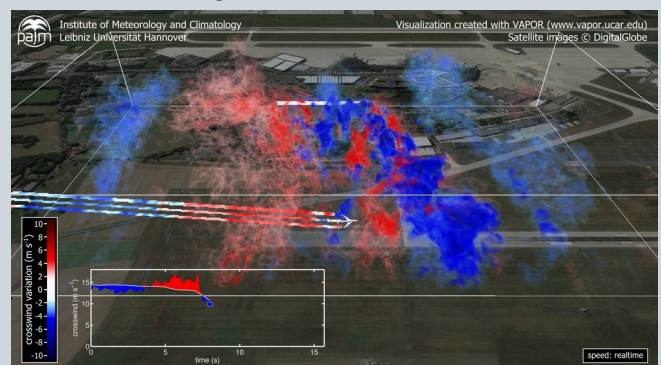
### Who is this seminar meant for?

This seminar is designed for future scientific users of PALM, who have yet little to no prior experience with PALM. **A solid background in modelling, particularly CFD-modelling, Fortran 2003, MPI, and Linux/Unix is of advantage.**

### What is the seminar about?

The one week seminar gives an overview of PALM, and demonstrates how to carry out runs - on Linux computers provided by the participants. Seminar contents comprise e.g. a general introduction to large-eddy simulation, an overview of PALM's governing equations, applied numerical methods, the various PALM features and application examples. Besides a brief introduction to the PALM installation, the main focus of the seminar is on how to set up PALM simulations, how to run them using the shell scripts provided with PALM, and how to analyse the output. Setups for several standard applications will be explained in detail (e.g. convection, flow around buildings, etc.). Further attention is given to topics like how to extend PALM by user-generated code and how to debug the code.

Besides the theoretical lessons which will be provided for download, there will be hands-on sessions, where participants carry out exercises under the online guidance of the lecturers.



*Building induced turbulence during final approach*

## What are the technical requirements?

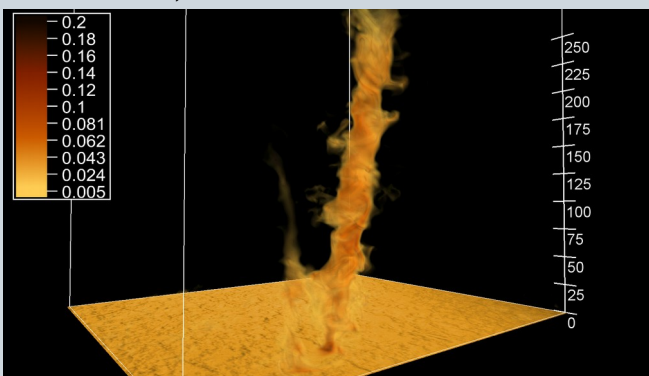
Participants should have meet the following technical requirements in order to participate:

- Linux- computer with at least a **quad-core processor** for running PALM during the seminar
- Camera, microphone, and speakers
- The following software is needed (installed in advance):
  - a pdf-viewer,
  - VLC player or similar,
  - ra *Fortran-2003 compiler*,
  - an *MPI library*,
  - the *NetCDF library* (version  $\geq 3.6.3$ ),
  - graphics software to display *NetCDF* data (*ncview*, *NCL*),
  - the *bash shell* (*bash*),
  - *python 3.6*,
  - as well as *subversion* (a revision control system necessary to download the PALM code).

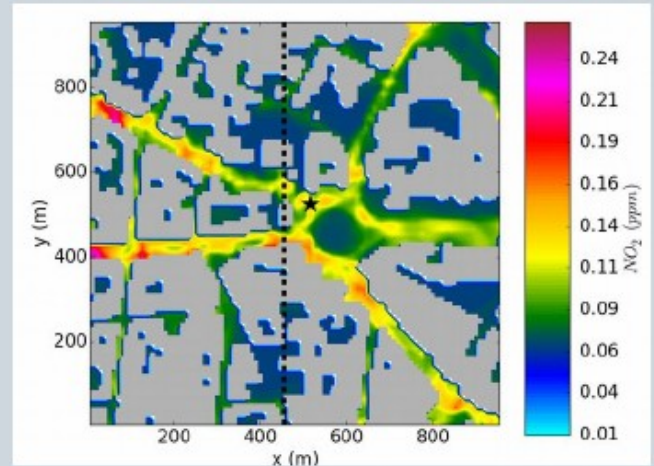
The successful software installation can be verified by installing PALM via the provided automatic installer:

<https://palm-model.org/trac/wiki/install>

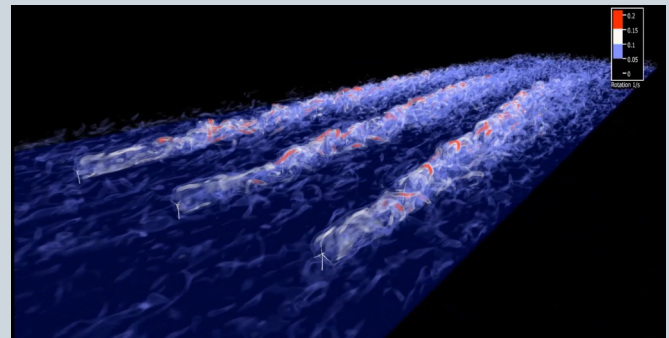
Please check this well in advance. There won't be any time to handle installation problems during the seminar. On Ubuntu Linux distributions, you can install all required software with one single *apt-get* command which you can find on our documentation page (under the link given above).



High resolution dust devil simulation with PALM.



With PALM simulated concentrations of  $\text{NO}_2$  at 13:30 UTC for Ernst-Reuter-Platz in Berlin.



Wake interactions in wind farms.

## Where can I register?

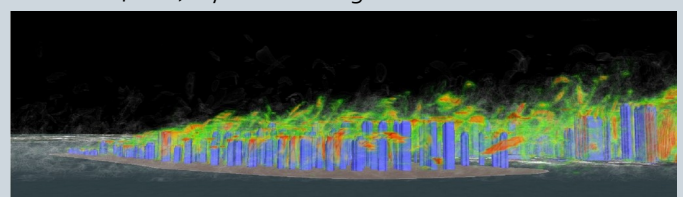
For the registration please fill the registration form:

<https://forms.gle/4tQCpHcmW2G82MBx8>

until latest **16<sup>th</sup> August 23:59 CEST**.

Please note that we might close the registration earlier if we reach our **maximum participant number of 50**.

Registered participants will receive more detailed information (method of payment, webinar tools, schedule, etc.) by end of August 2020.



Simulation of building generated turbulence for new reclamation areas in Macau

## Do you have any questions?

Feel free to contact Sebastian Hettrich:

[hettrich@muk.uni-hannover.de](mailto:hettrich@muk.uni-hannover.de)