# Lothar-Collatz-Seminar

## Thu, 04. July · 10:15 · Geom 1240

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### Multiscale Finite Element method application to Canopies in Earth System

**Abstract:** Mathematical Sciences connect climate science. According to literature the representation of single buildings in climate models is still challenging. In the porous media application, multiscale finite elements are used where subgrid features are upscaled at higher scales. In the present talk I will walk you through the mathematical, computational and application parts of the whole code. It is an extension of a previous semi-Lagrangian based multiscale finite element code developed by Dr.Konrad Simon, in which diffusion and velocity were uniform. This code is fully parallelized with deal.II C++ based library and can run across millions of degrees of freedom. Additionally, the high resolution Finite Element method is validated by wind tunnel experiments. The new canopy parametrization was developed where diffusion coefficient is used to represent canopies that is then taken to higher scale with modified basis function in multiscale finite element method.
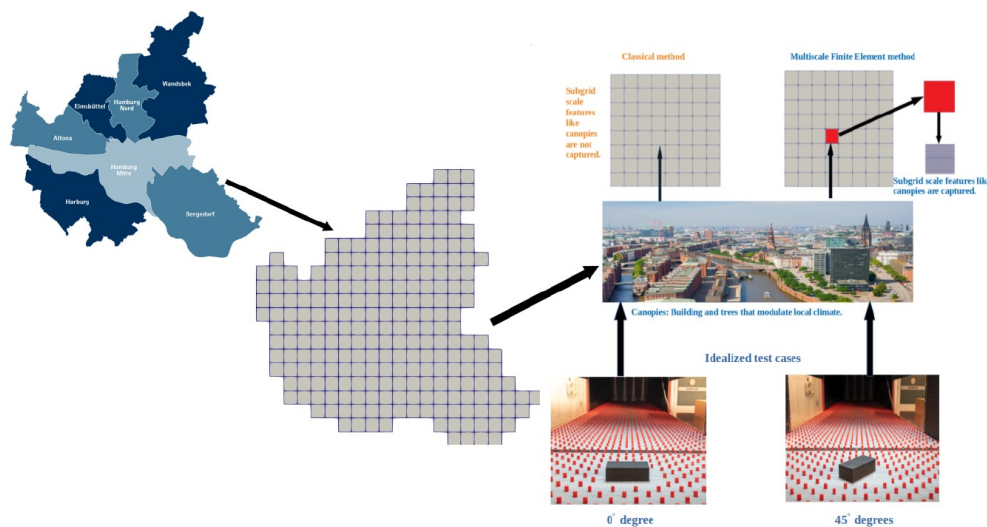
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