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# Microscale high resolution air-flow modelling

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In this contribution some test results of newly developed high resolution microscale model for air-flow in complex orography and geometry (urban areas, for example) are presented. Here we have focussed on the methods of turbulence parametrization.

There are two basic approaches how to implement turbulence to a model. The first one consists in using so called RANS (Reynolds Averaged Navier Stokes) equations and impact of turbulence describe via some turbulence model as the algebraic one, the one-equation or two equation ones. There are some limitations and results seem sometimes not satisfactorily. Another approach is based on the utilization of so called LES (Large Eddy Simulation) methodology that is a quite good compromise between DNS (Direct Numerical Simulation) especially for the turbulent flow with the higher values or Reynolds number (Re) in complex geometry and some simple approach. Recently a new possible approach emerged especially in connection with non-linear high resolution numerical schemes used for Navier-Stokes equation non-linear terms. The non linear approach is not only a numerical integration scheme but its impact is quite similar to that of subgrid scale (SGS) models used in the classic LES. This approach has been abbreviated as MILES (Monotonically Integrated LES) or sometimes called also as the implicit LES.

In this contribution a high resolution model where the MILES approach has been used together with the Immersed Boundary Method (ImBM) for implementing complex geometry is described and some still preliminary results are presented.

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