



Large Eddy Simulation of flow over hills: comparison with wind tunnel and field observations

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The accuracy of meteorological predictions is closely related to the knowledge of the wind fields near the earth's surface. To be reliable, simulations of the air motion should capture the larger energy containing eddies in the turbulent atmospheric boundary layer. In this study we test a Large Eddy Simulation (LES) code developed at Johns Hopkins University and extended at EPFL, which is based on the lagrangian scale dependent dynamic subgrid-scale model. Ideally the code should be capable of describing wind fields around rugged topography. The presence of these hills is implemented in our code using an immersed boundary method (IBM) that gives good comparison with published wind tunnel data. Here we extend the simulations to the field campaign held on the Bolund Island (Denmark). Numerous wind and turbulence measurement devices were deployed around the island. As this island has no significant temperature effects the simulations are all run under neutral atmospheric stability. Comparison of the simulations and field measurements are presented in this talk.