



Modelling of wind speed profiles in complex terrain and comparison with sodar measurements

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The interest in wind energy production and other renewable resources is rapidly increasing in the Czech Republic. It is followed by the need for more precise and more detailed wind resource assessment. The state-of-the-art technology allows the construction of considerably high towers for wind turbines even in complex terrain. Consequently the blades reach the heights far above the layer where the logarithmic wind profile is considered to be valid.

The main goal of our project was the modelling of wind fields and wind speed profiles in the complex terrain of mountainous range of Krusne hory (Ore mountains). Due to the favourable wind conditions, this region is the most suitable for construction of wind turbines in the Czech republic. We applied selected non-hydrostatic meso-scale models, including KAMM and PIAP. The numerical simulations with the models were performed for given scenarios of ambient flow, described by geostrophic wind speed and direction, and temperature stratification. Besides the numerical modelling we also carried out the sodar campaigns in the studied area. In that case, the initialisation of the models corresponded to weather situations during the wind profile measurements. As the information of wind profile structure above complex terrain is scarce, our team measured the wind profiles simultaneously with two Doppler sodars during various synoptic situations. The wind profilers were usually situated between 500 and 1000 m away from each other. Finally, the measured profiles were compared to the simulations.