



Analysis and Modelling of Extreme Wind Speed Distributions in Complex Mountainous Regions

Mohamed Laib and Mikhail Kanevski

University of Lausanne, Institute of Earth Surface Dynamics, Lausanne, Switzerland (Mohamed.Laib@unil.ch)

Modelling of wind speed distributions in complex mountainous regions is an important and challenging problem which interests many scientists from several fields. In the present research, high frequency (10 min) Swiss wind speed monitoring data (IDAWEB service, Meteosuisse) are analysed and modelled with different parametric distributions (Weibull, GEV, Gamma, etc.) using maximum likelihood method. In total, 111 stations placed in different geomorphological units and at different altitude (from 203 to 3580 meters) are studied. Then, this information is used for training machine learning algorithms (Extreme Learning Machines, Support vector machine) to predict the distribution at new places, potentially useful for aeolian energy generation. An important part of the research deals with the construction and application of a high dimensional input feature space, generated from digital elevation model. A comprehensive study was carried out using feature selection approach to get the best model for the prediction.

The main results are presented as spatial patterns of distributions' parameters.