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Wind Gust Forecasting in Iceland with the Method of Brasseur

H. Ágústsson (1,2,3), H. Ólafsson (1,2,3)

(1) University of Iceland, Reykjavík, Iceland, (2) Icelandic Meteorological Office, Reykjavík, Iceland, (3) Institute for Meteorological Research, Reykjavík, Iceland, halfdana@hi.is

Wind gusts are parameterized in a numerical weather prediction model using a new method based on considerations of turbulence and atmospheric stability in the planetary boundary layer. This method was recently introduced by Brasseur and has already been successfully applied to various atmospheric situations, amongst those several in the complex terrain in Iceland. In this study, the method is applied to a large collection of simulations of flow over Iceland. The simulated data is generated with the MM5 numerical model at a high horizontal resolution and using boundary conditions from the ECMWF. The performance of the method is validated by comparison with wind gust observations from a collection of automatic weather stations spread throughout flat and mountainous terrain in Iceland. The accuracy of the method is strongly dependent on the accuracy of the simulated atmospheric fields and for locations where the mean wind speed is well simulated, the predicted wind gusts are found to be in general in acceptable agreement with the observations.