Geophysical Research Abstracts, Vol. 8, 08959, 2006
SRef-ID: 1607-7962/gra/EGU06-A-08959

Forecasting wind gusts in Iceland

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 calculated using a new method which compares turbulent energy and atmospheric stability in the planetary boundary layer. The method has previously been successfully applied to a variety of atmospheric situations in complex terrain. Here it is applied to a large collection of atmospheric simulations which are mostly a part of realtime numerical simulations used in forecasts at the Icelandic Meteorological Office.

The atmospheric data is generated with the MM5 model at a high horizontal resolution and with boundary conditions from the ECMWF. The gust prediction method is implemented as post-processing within the IDL environment, into which the simulated MM5-data is imported using the mm5idl-package. Work is currently under way to implement the gust prediction directly into MM5 as a part of the PBL scheme.

The gust estimates are compared to wind gust observations from automatic weather stations spread throughout the complex terrain of Iceland. On average, the observed wind gusts are well captured where the atmospheric model correctly simulates the mean wind as well as other dependent atmospheric variables in the boundary layer. There are however various points that need special attention and improvement, e.g. maximum gusts in downslope windstorms are underestimated when an accurate gust estimate is particularly important and there appears to be a systematic overestimate of gust strength downstream in mountain wakes. Presumably, the performance of the method may in some cases be partly improved by more accurate atmospheric simulations and/or possibly a somewhat different approach in the method itself.