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The largest wind forecast errors in complex terrain

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The largest short term wind forecast errors are very often associated with rapid changes in wind speed. The numerical model may increase the wind a little to early or a little to late. In order to assess the problem, an extended study of rapid changes of wind speed is undertaken, using more than 20 millions of observations in Iceland. Most of the rapid changes are associated with gravity waves and downslope windstorms, but there is also a number of cases characterized by spatial gradients in the wind speed associated with mountain wakes. Observations indicate that errors in the simulation of these winds are associated with non-stationarity of the flow and inaccuracies in the length of gravity waves. These features may be hard to predict in a deterministic manner.