



## **Analysis of a new extreme precipitation event in Reykjavik**

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On 28-29 December 2012 a new precipitation record of 70.4 mm in 24 hours was made in Reykjavik, Iceland. This extreme event is explored by means of observations and by numerical simulations by different models and different times of initialization. Several key factors in creating the precipitation extreme are identified:

a) Slowly moving upper level low with high values of vorticity and vorticity advection.

b) A south to north low-level temperature gradient set up by cold advection in the wake of a surface low and warm advection in easterly flow over Iceland, enhanced by the topography (foehn). This temperature gradient leads to strong vertical windshear with very weak winds at the surface, but up to 40 m/s from the SE in the upper troposphere. As there are no strong winds at low levels, there is hardly any precipitation shadow in Reykjavik, downstream of the Reykjanes mountains.

In terms of considerable, but not extreme precipitation, the event was in general reasonably well forecasted 24 to 48 hours ahead. The above analysis leads to a method to identify extreme precipitation of this kind in large scale models. The method will be used to investigate the frequency of similar events in future climate scenarios.