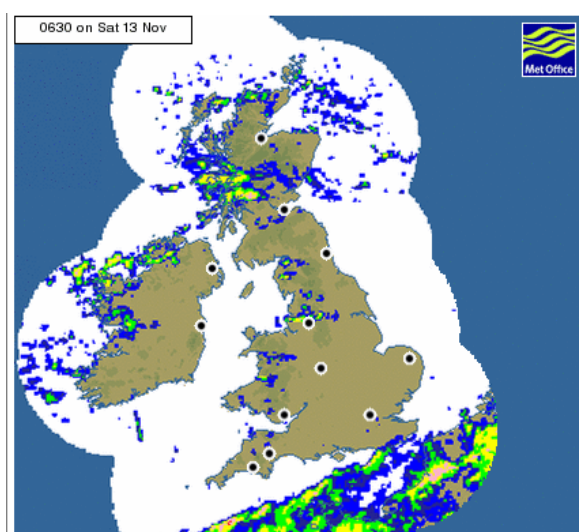


The generation of downwind rainbands by mountains

Supervisors: Suzanne Gray (Univ. Reading), David Schultz (Univ. Manchester), Dan Kirshbaum (McGill University)

Bands of rain (rainbands) that remain stationary relative to orography are gaining recognition for their potential to focus rainfall over localized regions and enhance flash-flooding risks in vulnerable watersheds. Despite these hydro-meteorological hazards, the prediction of these features is compromised by insufficient understanding and inherent limitations of numerical weather forecast models (such as those used by the Met Office).

The focus of this project is on idealised modelling of stationary rainbands that form downwind of mountains. The goal is to investigate the mechanisms that lead to the formation of these bands and determine how these mechanisms depend on the environment and mountain characteristics such as height and width.



Rainbands observed by rainfall Radar over the West side of the Pennines and in Wales on 13th November 2010

The student will join the PREcipitation Structures over Orography (PRESTO) project. This project also funds two postdoctoral researchers, one at the University of Reading and the other at the University of Manchester, and involves project partners at the Met Office and other research institutes. The post-doctoral researchers are performing research to construct and synthesize a multi-region climatology of orographic rainbands using a combination of high-resolution operational observations and model re-analyses and pinpoint physical mechanisms using convection-resolving simulations of a small number of observed cases. The student will provide a strong theoretical underpinning to the project by analysing a large number of controllable idealised simulations. The simulations will use the idealised version of the Met Office's operational weather forecast model.

The student will join our 'Mesoscale group', a thriving group of students and Departmental and Met Office researchers who are investigating weather phenomena:

see <http://www.met.rdg.ac.uk/mwp>

Student profile:

This project would be suitable for students with a degree in mathematics, physics or a closely related physical or environmental science.

Funding particulars:

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