



Experiences with a 100m version of the Unified Model over an urban area

H.W. Lean

MetOffice@Reading, University of Reading, Reading, UK

With the recent increases in resolution operational weather forecast models, for example the UKV, the Met Office UK 1.5km configuration of the Unified Model (UM), can start to resolve urban areas and give Urban Heat Island signatures. At the same time very high resolution versions of the UM (down to 100m gridlength) are beginning used for various research activities (i.e. looking at cold pooling in valleys and convection). In this paper we look at some preliminary experiments with 100m UM configurations over London to compare with observations from the ClearLo and ACTUAL observational campaigns.

With 100m gridlength the land surface data in the model resolves far more detail in terms of parks, rivers etc than the operational 1.5km configuration. Two clear sky daytime cases with convective boundary layers will be presented. As would be expected the model surface temperature responds to the detailed surface information. It is shown that, when large enough domains are used, the 100m model explicitly represents overturning in the boundary layer in reasonable agreement with lidar vertical velocity measurements. An analysis of the resolved and unresolved fluxes in these cases will be presented and compared to the representation in a 1.5km and 500m model. Other comparisons of small scale features with observations will also be presented.