



## **The diabatic role of cloud and precipitation processes within mid-latitude storms: Results from the DIAMET project**

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We present an overview of research highlights from the DIAMET project (DIAbatic influences on Mesoscale structures in ExTratropical cyclones). DIAMET is a NERC-funded project that took place over four intensive observation periods between 2011 and 2012, providing detailed ground-based and in-situ measurements of a variety of severe weather systems affecting the UK. Here, we focus on the role of latent heating and cooling associated with cloud microphysical processes in terms of the dynamic evolution of mesoscale weather phenomena (e.g. fronts, rainbands and wind storms) embedded within synoptic scale storms. Ice processes are particularly complex and are treated relatively simplistically in weather forecast models, hence a review of the role of ice processes on mesoscale structures is urgently needed to assess whether existing parameterizations are fit for purpose in terms of representing diabatic effects.

We begin with a review of the key findings from the aircraft cloud microphysics measurements made during DIAMET, and go on to discuss how these measurements have helped to inform the development of new and improved bulk microphysics schemes for use in mesoscale weather models. We also show how such models can be used to provide insight into the diabatic influence of microphysical processes in both summer and winter case studies.