

1.27 A STUDY OF HEAVY AND PERSISTENT PRECIPITATION IN SW ENGLAND

A. BLYTH^{1,2}, Y. HUANG², L. BENNETT^{1,2}, D. DUFTON³

¹ National Centre for Atmospheric Science, UK

² School of Earth and Environment, University of Leeds, UK

³ Swedish Meteorological and Hydrological Institute, Sweden
alan.blyth@ncas.ac.uk

Observations were made with three aircraft, a ground-based X-band radar (NX-Pol) and several other ground-based instruments during the CONvective Precipitation Experiment (COPE) in the southwest peninsula of England during the summer of 2013. Convergence lines form in the region as a result of colliding sea-breeze fronts. Convective clouds often develop along the lines sometimes resulting in flash flooding. The most infamous recent example occurred in Boscastle in August 2004. The flash floods and convergence lines have been studied using models and the UK Met Office (MO) network radars and rain gauges, but observations of the microphysics and dynamics of the systems had never been made until COPE.

Modelling results and observations of a quasi-stationary convective system on 3 August 2013 will be presented. Heavy precipitation persisted for several hours in a fairly localised region, although a flash flood did not occur. The measurements on this day were made with two research aircraft (University of Wyoming King Air and UK BAe 146), the NXPol radar, the MO network of radars and ground-based aerosol instruments. NXPol made PPIs with a volume return time of about 5 mins. The WRF model run at 400-m resolution and a detailed microphysics model were used to help interpret the observations. The interplay of the warm rain process, freezing of supercooled raindrops, growth and then melting of graupel particles and cloud-scale dynamics (multiple thermals) appears to be key to the intensity and persistence of the precipitation.