

High resolution polarimetric radar observations in Southern France during the second HyMex SOP 2013-2014

John Kalogiros

National Observatory of Athens, Greece

Anagnostou, Marios (National Observatory of Athens, Athens, Greece)

Delrieu, Guy (Laboratoire d'étude des Transferts en Hydrologie et Environnement, University of Grenoble, France)

Boudevillain, Brice (Laboratoire d'étude des Transferts en Hydrologie et Environnement, University of Grenoble, France)

Anagnostou, Manos (Civil and Environmental Engineering, University of Connecticut, Connecticut, USA)

E-mail: jkalog@noa.gr

The mobile X-band polarimetric radar (XPol) of the National Observatory of Athens, Greece, was installed in the Deaux airport in Gard area (Rhône Valley region), Southern France, as well as in-situ equipment consisting of rain gauges and disdrometers within the range of the radar during the second Special Observation Period (September 2013-January 2014) of the HyMeX (Hydrological cycle in the Mediterranean Experiment) international research program. The final purpose of the experiment was to quantify high-impact precipitation events, inducing flash-floods in complex mountainous terrain basin, and to use this information to quantify the error propagation of high-resolution satellite precipitation products in flood modelling. Three major intense convective rain events were recorded during the autumn months of the observation period, in one of which a flash flood occurred in the mountainous area north of the radar. Also, stratiform rain events were recorded in December and January with clear melting layer characteristics. Recent developed algorithms for attenuation and vertical reflectivity profile correction on radar data and rain microphysics were applied to XPol data. The results are compared against the rainfall and microphysics parameters measurements from the in-situ sensors for both types of rain events. In addition, the measurement of XPol are compared with operational C-band radar data available in the area and the significance of high resolution radar data from XPol in the estimation of spatial distribution of rainfall and its significance for flash flood warning is evaluated.