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# Performance of Rainfall Algorithms from Mobile X-band Dual-Polarization Radar over Complex Terrain: Result from the 2006-2007 Hydrate Project

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Precipitation estimation over complex terrain is of great significance due to the spatial – temporal variability of precipitation that controls the terrestrial hydrological processes. The standard remotely-sensed precipitation products, from large operational S- or C-band network radars, have spatial resolutions that are often too coarse to reveal hydrological important spatial variability that compromise the prediction of floods. Dual-polarization X-band (XPOL) radar is a potential solution as a gap filling data source for such operational weather radar networks. During the winter and fall of 2006 the HYDRATE project included field experiments from two complex terrain settings in Southern Europe: Western Crete and Eastern part of the Italian Alps. The experiment includes data from XPOL radar dense network of raingauges and disdrometer. The distrometer observations are used to "calibrate" the XPOL radar in terms of biases in horizontal and differential reflectivity and locally derived rainfall relationships. This study focuses on the performance evaluation of different rainfall (standard and polarimetric) algorithms. The complex terrain can significantly reduce the performance of rain measurements along a radar ray. Statistical comparisons of rainfall retrievals from XPOL (with or without beam blockage – BB and vertical profile correction – VPR) to raingauge rainfall measurements are performed for different radar

ranges and temporal scales of aggregation.