



Estimation of Moderate Rain Rates with Operational Polarisation Radars.

R.J.Thompson (1), **A.J. Illingworth(1)**, and W. Szalinska(2)

(1) University of Reading, UK; (2) Institute of Meteorology and Water Management, Wroclaw, Poland. (a.j.illingworth@reading.ac.uk/phone:+44-118-378-6508)

Operational C-band radars with polarisation capability are currently being installed in Europe and promise to provide much more accurate rainfall estimates than available from conventional radars. Much of the rainfall occurs in the 3-10mm/hr range and is accompanied by negligible differential phase shifts so any polarisation algorithms can use only the differential reflectivity, ZDR, parameter. For the scanning rates and resolution required for operational radars the random noise of ZDR is at best 0.2dB and, for low Doppler width conditions, it can be nearer to 0.4dB. This means that the use of ZDR and Z to derive rainfall on a gate by gate basis is error prone with occasional negative values of ZDR becoming more frequent for the lower rainfall rates. Instead we suggest examining the behaviour of Z and ZDR over a region of rainfall and so estimating the value of N_w , the normalised raindrop concentration parameter, over that region. The value of N_w is then related to the value of 'a' which should be used when deriving the rainfall from the conventional reflectivity, Z, using $Z = a R^b$. We will present results of this technique us