A critical issue in measuring rainfall with radar is the determination of whether the rainfall is convective or stratiform and thus composed of either large and rather homogeneous structures or small sparsely distributed cells respectively. This critical difference in rainfall depends mainly on the turbulent characteristics (e.g. the local Reynolds number) of the wind velocity field in particular the vertical velocity profile. They are fundamental drivers for the drop size distribution and therefore determine the values of the coefficient and the exponent used in Marshall and Palmer’s formula for relating radar reflectivity and rainrate. It is therefore of great importance which flow regime should be chosen in order to obtain accurate results. A recent spectral analysis on wind data, taken at 10Hz at the height of 43 meters, showed linear scaling on a log-log plot (i.e. a unique power scaling) for all three of the velocity components at small-scale. At scales larger than 40 seconds isotropic behaviour is no longer visible and there is a departure of scaling for the vertical velocity component. This anisotropy can be exploited with the application of an anisotropic multifractal model which will give a much more detailed picture of the vertical velocity profile. Multifractality of the velocity field as an alternative to Taylor’s frozen turbulence hypothesis gives a more efficient and accurate estimation of the Reynolds number.