



A parameterisation for the vertical overlap of clouds as a function of wind shear

Francesca Di Giuseppe (1) and Adrian Tompkins (2)

(1) ECMWF, Reading, UK (nen@ecmwf.int), (2) ICTP, Trieste, IT

More than eight million cloud scenes from CloudSat observation have been analysed in conjunction with co-located ECMWF analysis data to identify an empirical relationship between cloud overlap and wind-shear that can be applied to global models with confidence.

The analysis confirms that to a good approximation clouds separated by clear sky gaps are randomly overlapped while continuous cloud layers are close to be maximally overlapped at small separations, but decorrelating in height.

The analysis also reveals the very obvious and systematic impact of wind-shear on the decorrelation length-scale, with cloud decorrelating over smaller distances as wind shear increases. A simple linear-fit parametrisation is suggested that is straightforward to add to existing radiation schemes.