



Investigation of water vapour variability induced by surface heterogeneities and fronts

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The VAPIC project is a field experiment that took place in May-June 2004 in the Paris suburban area, focusing on improving retrievals of water vapour fields and their variability. Both ground-based (GPS, microwave radiometer, Raman LIDAR, radiosoundings) and space-borne (MODIS, MERIS, AIRS) measurements were collected during the experiment, leading to an extensive inter-comparison work.

In this study we focus on examining the temporal and spatial variability of the water vapour field based mainly on radiometer and GPS measurements (Integrated Water Vapour and gradients). We focus initially on the spatial variability of water vapour and its link to the urban or rural surface properties. Detailed analyses of GPS IWV and gradient measurements are used to investigate the impact of surface heterogeneities on the diurnal cycle of water vapour. We then describe the temporal water vapour variability relative to the successive front passages. A water vapour classification is derived for the different frontal situations encountered during the experiment: we study how the amplitude and the gradient of the temporal water vapour variations are connected with the main features of the fronts (wind, pressure, precipitation, clouds).