



A case study of stratus fog

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A case study of stratus fog is presented which occurred over central southern UK during 11th and 12 December 2012. The case was not well forecast by numerical prediction models which produced sufficient low cloud, but not enough fog, and then cleared any fog too quickly during the daytime. The case was characterised by a very rapid spreading out of a fog/low stratus layer, from its edge. The dynamics of the layer are examined and it is concluded that it spread due to turbulent mixing created by a thermal gradient across the edge of the layer. Further observations show that during the night of 11-12th December the fog layer gradually cooled, but in-cloud liquid water content remained approximately constant and appeared to balance with measurements of fog droplet deposition made at the surface, resulting in a layer that appeared to be close to equilibrium. Finally the break-up of the layer was observed during the morning of the 12th December, and seen to arise from a combination of subsidence of fog top which lowered some 200m during its lifetime, fog-top wind shear which mixed drier air into the layer, and advection of a drier air-mass from the south. A companion paper (Porson et al) presents results from a numerical weather forecast ensemble system for this case.