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Observations of stable boundary layers over a seasonal time scale in south-east England

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First results from the Stable Boundary Layer Experiment (SABLE) are presented. The campaign took place at the Met Office Meteorological Research Unit at Cardington Airfield between December 2006 and October 2008. The aim is to understand seasonal changes of stable boundary layers. In most operational models the boundary layer parametrisation uses stability functions based on Monin-Obukhov theory which predicts that turbulence is suppressed when the Richardson number exceeds a critical value. Depending on the form of the stability function, for instance, the surface temperature is colder than the observations suggest. By analysing different times of the year it is possible to identify different types of development during stable nights and perhaps move away from one parametrisation for all seasons. However the main emphasis here is to highlight seasonal variation of the stably stratified boundary layer.

This unique data set is compiled of routine turbulence measurement at 10m, 25m and 50m. During 18 IOPs (Intensive Observation Period) the Met Office tethered balloon based turbulence probe was also flown and radiosondes released. In addition surface based turbulence measurements are also available from a site around 10km away and differences between the two sites will be presented.