

Sensitivity of the stable boundary layer to the humidity contents far from saturation

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A steady-state low-level jet observed in the Stable Atmospheric Boundary Layer Experiment in Spain-1998 (SABLES-98) campaign is simulated using a Large-Eddy Simulation model. The radiation is taken into account since its contribution to the budget of the tendency of temperature is as important as the contribution of the turbulence in the surface layer.

The resulting regime is a two-layer flow separated by a temperature inversion at the level of maximum speed. The runs are compared to the observations through mean profiles, time series and probability density functions.

The consideration of the humidity in the integrations has a large impact in the characteristics of the temperature profile in the sub-jet layer, being much closer to the observations than the run neglecting it. On the contrary, the main features of the wind profile are not changed.