ABSTRACT

Authors: Leonardo Alcayaga, Gunner Larsen, Mark Kelly, Jakob Mann

Coherent structures have attracted the interest of researchers for decades, being viewed as the closest to `order’ that we can find within the chaos of turbulence. In the turbulent atmospheric boundary layer, micro- and meso-scale coherent structures come in many shapes and sizes, such as convective cells, rolls, or streaks. In this study we used dual Doppler lidars, developing analysis of their tandem usage to characterize in detail some of the large-scale coherent structures generated over flat terrain with relevance for wind energy applications. This allowed us to better understand the mechanisms that generate such structures and describe their influence on the morphology of the turbulent atmospheric boundary layer across a good deal of its depth.