

Wind tunnel study of convective boundary layer capped by a strong inversion layer

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Experiments on simulating the atmospheric convective boundary layer (CBL), capped by a strong temperature inversion and affected by surface shear, were carried out in a thermally stratified wind tunnel. A quasi-stationary, horizontally evolving CBL was reproduced in the tunnel, with two overall Richardson numbers Rib in the lower part of the layer and Rit in the inversion layer up to -0.74 and 27.2 , respectively. The comparison of the wind tunnel data with the results of atmospheric and water tank studies of CBL shows the crucial dependence of the turbulence statistics in the upper part of the layer on the parameters of plume impingement and entrainment, as well as the modification of the CBL turbulence regime by the surface shear.