



On the marine atmospheric boundary layer at very strong winds

V. Kudryavtsev

Nansen International Environmental and Remote Sensing Center , St. Petersburg, Russia,
(Vladimir.Kudryavtsev@niersc.spb.ru)

Dynamics of the Marine Atmospheric Boundary Layer (MABL) at strong winds is considered. Motivation of this study is the field and laboratory findings on the effect of suppression of surface drag and the saturation of the surface roughness at very strong and hurricane winds. The main attention is paid on the effect of sea droplets on atmospheric turbulence through the buoyancy forces (the spray contribution to net evaporation is ignored). Production of the spray droplets at the sea surface is described in terms of the spray generation function (SGF). It is shown that if SGF is used as the surface boundary condition, then the effect of spray on MABL is negligible at any wind speeds. An alternative approach is to model spume droplets generation as a volume source. In this case, at strong winds (> 30 m/s) sea droplets suppress the turbulence in the near surface layer, that results in suppression of the surface drag and acceleration of the airflow. The comparison with available field and laboratory observation is presented.