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PBL Height in a Clear and Cloudy Layer

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In this paper it is presented and compared some characteristics of the Planetary Boundary Layer in the presence and absence of clouds. It is well know (Garstang and Fitzjarrald, 1999) that the simple concept of a boundary layer holds only in the absence of convective clouds. When clouds are presented the connection between the surface and the atmosphere are due to cloud-induced motions. In July-August 2008 a micrometeorological campaign was developed in a near homogeneous surface in the south of Brazil. Micrometeorological data was collected over a 7-week time and the database comprises measurements of wind speed, wind direction, turbulence, temperature, humidity, pressure and solar radiation. Energy budgets as well as statistics of turbulence parameters are then computed in a classical way. Measurements with tethered balloon were also performed in order to determine structure and linkages of the convection in the lower cloud, at the cloud base, and in the mixed and surface layers below the cloud. Hence, the purposes of the present study is to focus on the characteristics of the PBL as well as its height determination during clear sky and under cloudy conditions using observational dataset and LES model.

Reference

Garstang, M. and Fitzjarrald, D., 1999, Observations of surface to atmosphere interactions in the tropics, Oxford University Press, 405pp.