



Variance of the Boundary Layer Structure in Dependence of distinct Circulation Types

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Variability of local climate features is related on the one hand to large scale circulation patterns, but is modified additionally by regional or local influences. This is true for basic climate variables like temperature and precipitation but also for more complex environmental conditions like air quality, e.g. PM10 concentration. Regional and local influences are to a large extent represented by the atmospheric boundary structure, i.e. the height of the mixed layer or its stability determining fluxes of temperature and impulse as well as water vapor etc.

The presented study focusses on the interaction between the boundary layer structure and large scale circulation types for selected radiosonde stations. Circulation is described by a k-means cluster analysis of European circulation fields, retrieved from the NCEP/NCAR reanalysis. The boundary layer structure is derived from European radiosonde data collected in the Integrated Global Radiosonde Archive (IGRA). Here the mixed layer height and stability indices are analysed for within-type variance in a first step for different circulation types created independently from any other information. In a second step circulation types are created including boundary layer information. Both kinds of types are then related to local impact variables in order to achieve conclusions about the interdependence of both, the large scale circulation and the boundary layer structure in modifying local climate variables.