Local wind speed profiles and the stability parameter μ under unstable conditions

L. Cvitan

Meteorological and Hydrological Service, Grič 3, 10000 Zagreb, Croatia

Tel. +385 1 4565687, Fax: +385 1 4565630, E-mail: cvitan@cirus.dhz.hr

In the Pannonian lowlands of northern Croatia, at the natural gas site Molve, were taken tethered balloon radiosonde measurements mostly up to 150 m above ground during two periods, one in spring (13-17 March 1983) and one in autumn (16-19 October 1984). Separation between unstable and neutral (slightly unstable) cases for which is z/L$<$0, was initially performed by the universal similarity functions that enabled the best simulation of the measured wind speed profiles. Similarity functions and the Monin-Obukhov theory were included in both types of local wind models applied. For the initially determined stability classes, appropriate ranges of the μ stability parameter values, that represented limits between local stability classes, were determined afterwards. It turned out that for the operative determination of the stability at Molve, the Kazanski-Monin stability parameter (μ) was better stability parameter than the Monin-Obukhov parameter z/L. In this presentation are shown some results that confirm reasonably good unstable class separation based on parameter μ. Already the mean measured wind speed profile for the class locally proclaimed as unstable class, showed itself the typical characteristic for unstable stability. That is the profile that showed more uniform wind speed changes in the upper part of the layer considered than below, and indicated higher position of better-mixed layers (more developed turbulent eddies in higher layers).