

Selected instability indices in Europe

M. Siedlecki

Department of Meteorology and Climatology University of Lodz, Poland
(Siedlec@geo.uni.lodz.pl / Fax: +48 42 66-55-951)

The main goal of this study is to assess the spatial distribution in Europe of selected instability indices: K index, SWAT index, TT index, CAPE and BRN. The daily measurements taken at 00 UTC from 41 stations covering the region from 35°N to 65°N and from 35°W to 50°E from the period 1991-2005 were used. Data were taken from University of Wyoming (<http://weather.uwyo.edu/upperair/sounding.html>). In the annual course of all indices the summer maximum can be observed. In the spatial distribution of these parameters significant differences can be distinguished between northern, western, eastern and southern Europe. In the north and the west of Europe the differences between winter and summer seasons are relatively low, whereas in eastern (middle Ukraine) and southern Europe the intra-annual differences are strongly pronounced. Annual course of mean monthly values of the CAPE in the west and the north of Europe indicates on very low instability in these regions. The annual minimum of the CAPE occurs in winter and does not exceed 50 J/kg. From April to September the mean monthly values of CAPE are between 50 J/kg and 100 J/kg. In the south of Europe the winter minimum is lower than 200 J/kg, but the annual maximum occurs from June to September and exceeds 500 J/kg.

The high values of K and SWAT indices correspond with high instability. Both these indices reach their maximum values during summer. In the continental area the mean monthly values of the K index are greater than 22 and the values of the SWAT index exceed 150.