The diurnal course of the CAPE index values

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In this paper the dynamic of the spatial distribution of the CAPE index on the daily scale is studied. The daily measurements taken at 00 UTC and 12 UTC from 41 stations covering the region from 35ºN to 65ºN and from 35ºW to 50ºE from the period 1991-2005 were used. Data were taken from University of Wyoming (http://weather.uwyo.edu/upperair/sounding.html).

The spatial patterns of the CAPE index indicate that instability occur near the cold front or near the edge of weak anticyclonic circulation. The region of high instability is relatively small in winter, spring and autumn and moved from western to central part of Europe. During these seasons the typical values of the CAPE index reach 500-600 J/kg. The strongest instability centres occur in Jukly and August with the CAPE values reaching 2000 J/kg. The area with high values of the CAPE index spread from southern to central Europe.

On great plains in eastern Europe in summer the high instability is initiated by warming during the day and the fields of high CAPE values are strongly related to surface heating. The instability phenomena show the typical diurnal cycle as it can be seen on the 12 UTC CAPE maps.