



Spatial variability of the influence of the tropospheric thermobaric field on air temperature in Europe

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Atmospheric circulation is considered to be one of the most important factors responsible for current weather conditions as well as climate variability. The temperature at the Earth's surface is formed under the influence of advection of air masses with specific physical properties. Among these properties, the most significant in the context of the impact on the thermal conditions at the Earth's surface can be described as the thermobaric field. The study of the thermobaric field could give us a very clear insight into the thermal conditions of the troposphere. A careful examination will enable us to assess the impact of the troposphere (and its thickness) on the thermal conditions at the surface of the Earth.

The study is devoted to two main issues. The first is to describe of the relationships between thickness layer (among particular isobaric surfaces) and the air temperature near the ground. The second is to determine the spatial variability. The domain is Europe and Northeast Atlantic (40W-40E and 30N-80N).

Gridded data with spatial resolution of 2,5x2,5° from the NCEP/NCAR Reanalysis were used as the basic research material. Geopotential height data for 1000, 850, 700, 500 hPa from 12 UTC for entire period were the basis for all calculations. Research area covers Europe with North-East Atlantic Sector (40°W-40°E and 30°N-80°N).

The analysis carried out confirmed the relationship, demonstrating its considerable spatial diversification, variable throughout the year. However, the relationship is more complicated than expected. The results obtained indicate the existence of other relevant factors (including air-sea-land interactions, large-scale landform and atmospheric circulation), not related to a combination of the temperature and pressure fields in the free atmosphere, diversifying the examined relationship over the area of Europe.