



Heat transfer regime of the upper meter of soil: an analysis based on long-term meteorological data from Romania

D. Nitoiu (1), C. Demetrescu (1), A. Marica (2), C. Boroneant (2)

(1) Institute of Geodynamics, Bucharest, Romania (dnitoiu@stfx.ca), (2) National Meteorological Administration, Bucharest, Romania

Reconstruction of past climate changes using the geothermal approach relies on conditions such as a perfectly conductive subsurface and a strong GST-SAT coupling. During the last years, the validity of these assumptions for a variety of meteorological conditions has been questioned. The ground surface temperature is an integration of the surface energy budget and responds as well to SAT as to changes in precipitation, vegetation or snow cover. These processes have a strong effect on the heat transfer regime of shallow soils that in turn exerts a great influence on the downward propagation of the surface thermal signal. In this study, we investigate the conductive character of shallow soils for stations sampling different climate environments from Romania and analyze the propagation in soils of surface thermal signals with annual and longer periods using measurements of mean monthly SAT and soil temperatures at 0, 5, 10, 20, 60, and 100 cm since 1961.