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## Thermal signal propagation in soils in Romania: conductive and non-conductive processes

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**Abstract.** Temperature data recorded in 2002 and 2003 at 10 stations out of the 70 available in the Romanian automatic weather stations network are presented and analyzed in terms of the heat transfer from air to underground. The air temperature at 2 m, the soil temperatures at 0, 5, 10, 20, 50 and 100 cm below the surface as well as rain fall and snow cover thickness have been monitored. The selected locations sample various climate environments in Romania. Preliminary analytical modelling shows that soil temperatures track air temperature variations at certain locations and, consequently, the heat transfer is by conduction, while at other stations processes such as soil freezing and/or solar radiation heating play an important part in the heat flux balance at the air/soil interface. However, the propagation of the annual thermal signal in the uppermost one meter of soil is mainly by conduction; the inferred thermal diffusivity for 8 stations with continuous time series at all depth levels ranges from 3 to  $10 \times 10^{-7} \text{ m}^2 \text{ s}^{-1}$ .

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