



Two decades of temperature-time monitoring experiment: air - ground surface - shallow subsurface interactions

Vladimir Cermak, Petr Dedecek, Jan Safanda, and Milan Kresl

Institute of Geophysics, Academy of Sciences, Prague, Czech Republic (cermak@ig.cas.cz)

Long-term observations (1994-2013) of air and shallow ground temperatures at borehole Prague-Sporilov (50°02'28.5"E, 14°28'40.2"N, 274 m a.s.l.) have been thoroughly analyzed to understand the relationship between these quantities and to describe the mechanism of heat transport at the land-atmosphere boundary layer. Data provided a surprisingly small mean ground-air temperature offset of only 0.31 K with no clear annual course and with the offset value changing irregularly even on a daily scale. Such value is substantially lower than similar values (1-2 K and more) found elsewhere, but may well characterize a mild temperate zone, when all so far available information referred rather to southern locations.

Borehole data were correlated with similar observations in a polygon-site under four types of surface conditions (grass, soil, sand and asphalt) completed with registration of meteorological variables (wind direction & velocity, air & soil humidity, direct & reflected solar radiation, precipitation and snow cover). The "thermal orbits" technique proved to be an effective tool for the fast qualitative diagnostics of the thermal regime in the subsurface (conductive versus non-conductive).