



## **Long-term monitoring of the air - ground temperature coupling in the Czech Republic**

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Presented results of the long-term monitoring of the air-ground temperature coupling consist of the eight year (2003-2010) long soil- and air-temperature series from the observatory Prague – Spořilov located at the campus of the Institute of Geophysics in Prague (50° 02' 27" N, 14° 28' 39" E, 274 m a.s.l.). The soil temperatures (GST) under different types of surfaces (grass, sand, bare soil, asphalt) at the depths of 2, 5, 10, 20 and 50 cm, as well as the air temperatures (SAT) at 5 cm above each of the surface types and at 2 m above the background grass surface were recorded every 5 minutes together with other meteorological variables (solar radiation, humidity, soil moisture, precipitation and wind speed). The results indicate that the annual mean of the soil – air temperature difference depends strongly on the type of the surface – grass, sand, bare soil, asphalt – and amounts up to 4 – 5 °C. However, the inter-annual variation of the difference for the given surface is much smaller. For the first three (natural) types of the surface, the inter-annual variation does not exceed several tenths of degree C and does not show any statistically relevant trend. The collected data seems to corroborate the assumption about the constant offset between the ground and air temperatures on the time scale of tens of years and longer, which is essential for the climatic interpretation of the ground surface temperature history reconstructed from the temperature logs of deep boreholes.

We report also on the results of a soil temperature monitoring in the Jizerské Hory Mountains, which has revealed a difference between the mean annual temperatures under meadow and forest - the two most frequent types of vegetation covers in the area – of the order of 1.5 °C.

The soil temperature monitoring under the different types of surface has been complemented by a study of the soil temperature dependence on the slope angle and orientation. The soil temperatures were monitored at the depth of 40 cm on the northern and southern slopes of an E-W trending grassy ridge at the altitude of 590 m a.s.l. in the Šumava Mountains foothill. The mean annual temperature on the 14° northern slope was 8.6 °C and on the southern 11° slope it was 9.6 °C. The mean annual air temperature at 2 m above the ground measured 500 m apart from the experimental site on a flat grassy plot was 7.0 °C.