



Air - ground temperature coupling – results of the seven year temperature monitoring under different types of surface

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We present results of the seven year (2003-2009) ground – air temperature tracking at 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 surface (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 are recorded every 5 minutes together with other meteorological variables of solar radiation, humidity, soil moisture, precipitation and wind speed. Also presented are the results from a new observation site established during summer 2008 in Bedřichov (Jizerske Hory Mountains, Czech Republic) to determine GST difference under two typical types of vegetation cover (meadow and forest).

The mean annual ground temperature depends strongly on albedo of the surface, intensity of insolation and evaporation, and presence or absence of some form of insulation like snow or vegetation covers. The highest difference between mean annual GST and SAT was observed under asphalt surface due to its low albedo of about 0.04, obtained as the ratio between reflected and incoming shortwave solar radiation. The difference varied between 4.1 and 4.8 °C in the period 2003 – 2009, depending mainly on the number of sunny hours during summer months. In the case of sand, bare soil and grass, the temperature differences were in the range 1.5 – 2 °C (sand), 1.1 – 1.6 °C (bare soil) and 0.3 – 0.5 °C (grass). Typical values of albedo are about 0.11 (sand and bare soil) and 0.14 (grass). Mean annual temperature difference between meadow and forest observed at the depth of 0.5 m in Bedřichov was 1.5 °C.