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Monitoring of the Air – Ground Temperature Coupling in Three European Climatic Provinces

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Under the frame of a joint project, the coupling amongst air, soil and bedrock temperatures is being studied in three different climatic provinces of Europe, namely in Czech Republic, Slovenia and Portugal. The field stations have been established in Czech Republic (Prague), Slovenia (Kostanjevica) and in Portugal (Evora) and the temperature monitoring started in the years 2002, 2003 and 2005, respectively. The main aim of the monitoring is to explore and confirm (or not) the assumption of a long-term tracking between the mean annual surface air temperature and the ground surface temperature, which is vital for the climatic interpretation of the ground surface temperature history obtained from present-day temperature-depth profiles measured in deep boreholes. Data on the difference between mean annual soil and air temperatures and their inter-annual variability obtained from the three stations in the period 2003-2005 are presented. The mean annual difference at grassy sites amounts to 1 °C, both in Czech Republic and Slovenia; in addition, its dependence on the type of surface was studied in the Czech station, where it attains 1 - 1.5 °C in barren soil, 2 °C in a sandy surface and 4 - 5 °C in a surface covered by asphalt. The inter-annual variability of the difference seems to be of the order of tenths of degree Celsius for the grass, sand and barren soil, but up to 1 °C for the asphalt.