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Subsurface thermal signature of the ground surface temperature variations in the last 200 years in Romania as inferred from borehole data

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Temperature data from eight boreholes in the orogen bordering the Transylvanian Basin (Eastern Carpathians, Apuseni Mts.) have been inverted for ground surface temperature history (GSTH) in the last 200 years. The temperature measurements were obtained with a thermistor probe (sensitivity in the 0.01 K range) using the stop and go technique, at 10 m intervals, in the depth range 0-500 m. The least squares inverse modeling approach of Tarantola and Valette (1982), as well as the singular value decomposition approach of Beltrami and Mareschal (1995) have been used to infer the GSTH. Long-term air temperature records available from the Romanian weather station network have been examined and analyzed in terms of decadal trends of the surface air temperature (SAT) over the Romanian territory. GSTH and SAT results are discussed. The long wavelength GSTH as previously derived from deeper (1500 m) boreholes in the Transylvanian Basin (Serban et al, 2001) is also included in the discussion.