



Impact of the Surface-Atmosphere Variables on the relation between Air and Land Surface Temperatures

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The Land Surface Temperature (LST) is a key parameter for a large number of applications. It is usually determined using measurements or estimations of the longwave radiation emitted by a relatively homogeneous surface. Specifically, the uncertainties of LST related to the type of sensor looking to the surface or the sensitivity of a given sensor are estimated to be about 2 to 3 K, larger than those related to the uncertainties of the surface emissivity or of the downwards longwave radiation. The behaviour of the difference of the screen temperature of the air at 2 m with LST is explored using a two-year long series of several quantities, such as the soil moisture and temperature or the TKE and wind at lower levels. Daytime differences between -3 and -10 K are found near noon, rising to about -18 K for dry summer days, essentially driven by convective mixing. At night the differences are much smaller, typically under 3 K, better defined at the early part of the night in the cold months of the year. It is found that during day, there is a good correlation between the temperature difference and the soil moisture, temperature and the turbulence whereas at night no correlation is found with any of the available quantities. The lack of strongly stratified cases near the ground even in clear and calm nights show the important role of the soil to supplement heat as the surface cools radiatively.