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Soil water content spatial pattern estimated by thermal inertia from air-borne sensors

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Remote sensing of soil water content from air- or space-borne platforms offer the possibility to provide large spatial coverage and temporal continuity. The water content can be actually monitored in a thin soil layer, usually up to a depth of 0.05m below the soil surface. To the contrary, difficulties arise in the estimation of the water content storage along the soil profile and its spatial (horizontal) distribution, which are closely connected to soil hydraulic properties and their spatial distribution. A promising approach for estimating soil water contents profiles is the integration of remote sensing of surface water content and hydrological modeling. A major goal of the scientific group is to develop a practical and robust procedure for estimating water contents throughout the soil profile from surface water content. As a first step, in this work, we will show some preliminary results from aircraft images analysis and their validation by field campaigns data. The data extracted from the airborne sensors provided the opportunity of retrieving land surface temperatures with a very high spatial resolution. The surface water content pattern, as deduced by the thermal inertia estimations, was compared to the surface water contents maps measured in situ by time domain reflectometry-based probes.