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Seven years (2012-2018) of continuous observation of the surface energy budget and of soil moisture and temperature profiles in a peri-urban aera.

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In situ observational databases play a dominant role in all research disciplines. In hydrometeorological studies, water and temperature observations from field work are essential for validating differently sourced data, supporting theoretical modeling, estimating the energy budget relevant for several topics. A full set of in situ hydrometeorological observations is presented here from a grassland site located in Toulouse, France. This site has been continuously operated since 2012 by the instrumentation team of CNRM. This team has a long record of contributions to atmospheric measurements during international field campaigns. In particular, ground measurements to investigate turbulence, evapotranspiration and the surface energy budget have been regularly conducted during the last three decades.
The objective of the measurement system called “Meteopole-Flux” is to ensure a long-term monitoring of an urban grassland by documenting the exchanges of matter and energy between this surface and the atmosphere (turbulent flows, heat, water, and CO_2 fluxes, radiative fluxes, precipitation) as well as soil moisture and soil temperature from the soil surface down to a depth of 2.2 m. Moreover, vegetation growth and senescence is monitored.
For a better use of these data for the understanding of the surface-atmosphere exchenge processes and for the validation of land surface models, it is important to document the variability of the residual of the energy balance. The latter depends on atmospheric conditions, soil temperature and soil moisture conditions and the footprint of the site.
The purpose of this presentation is to present (1) an overview of the characteristics of the large dataset, (2) the evaluation of atmospheric and land surface numerical models at the land-atmosphere interface. The models used are the French numerical weather predictions models developped by Météo-France (AROME and ARPEGE) and the ISBA land surface model within the SURFEX modelling platform.