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Satellite calibration of a distributed hydrological model similarly to ground discharge measurements

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Distributed hydrological models of energy and mass balance usually need in input many soil and vegetation parameters, which are usually difficult to define. This paper will try to approach this problem performing a parameters calibration based on satellite land surface temperature data (LST) as a complementary method to the traditional calibration with ground data.
A pixel to pixel calibration procedure of soil hydraulic and vegetation parameters for each pixel of the domain is proposed according to the comparison between observed and simulated land surface temperature.
A distributed hydrological model, FEST-EWB, that solves the system of energy and mass balance equations as a function of the representative equilibrium temperature (RET) will be used. RET is comparable to the land surface temperature as retrieved from operational remote sensing data.
This equilibrium surface temperature, which is a critical model state variable, is compared to land surface temperature from MODIS.
A similar calibration procedure will also be applied performing the traditional calibration using only discharge measurements at different available control cross sections.
The dynamic of two big lakes in the basin will also be anlyazed; FEST-EWB model is calibrated using MERIS data to infer surface area changes and altimetry data for water level.
This approach will be tested for the Yangtze River basin (China) from 2003 to 2006, a basin of about 2'000'000 km2.