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Reducing parameters uncertainty of a distributed hydrological model by using ground stations and remote sensing data

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Complete and distribute models, based on physical equations must mimic a variety of hydro-meteorological processes. This often leads to design very complex models with a high degree of parameterization.
The necessity to assimilate data of different nature observed by ground stations and remote sensors can be sometimes incompatible with the degree of complexity and parameterization of such models.
This work presents an attempt to reduce the uncertainty of the parameters of a continuous distributed model by augmenting the parameters constraints. This latter objective is pursued using both ground stations and remote sensed data and exploiting the characteristic of the model of simulating various state variables, specifically the land surface temperature and the soil humidity of the root zone.
The model has been then calibrated introducing satellite and ground stations data in a simple multi-objective function. The results have been compared with those obtained by a standard calibration strategy based on streamflow data.