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Short-Time Estimation of Irrigated Crops Water Demand with the Use of SWAP Agrohydrological Model, Meteorological Forecasting and Remote Sensing of Land Surface Temperature

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One of the practical applications of the agrohydrological modeling at the level of agricultural field based on SWAP-system (Soil-Water-Atmosphere-Plant) is aiming to increase the efficiency use of the soil moisture stored in root zone by irrigated crops. This modeling at short time could help to estimate the water demand of irrigated crops in the base meteorological forecasting and remotely sensed data of land surface temperature.
In many cases, agrohydrological estimation efficiency depends of the heat and water flow parameterization accuracy creating divergences between results of modeling and reality. Sources of such divergences are mostly dependent of the inaccuracy of meteorological forecasting as well as soil evaporation and crop transpiration values.
Technique based on ensemble method linking the SWAP-modeling and assimilation of remotely sensed data was developed. Such technique is aiming to correct short time estimation of water uptakes by crop roots. By this mean, it provides opportunity to reduce an uncertainty of the water storage results done by SWAP-modeling. Thus is done by the use of soil evaporation and crop transpiration estimated from remote sensing and meteorological forecasting data. It allows to use step-by-step on time updating of SWAP-model parameters such soil evaporation and crop transpiration. Thus provide mean to avoid propagation of errors in agrohydrological modeling results.
This contribution aims to communicate an illustrative explanation about the application of a combination of meteorological and remotely sensed data as well as SWAP agrohydrological model and ensemble modeling. Some results analyzing soil water regimes of crops irrigated by sprinkling machines are presented and assessed.

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