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Increased number of crop types over France in the ISBA-A-gs land surface model : does it improve the regional simulation of LAI ?

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Land surface models have at first been designed to represent natural vegetation classified in broad Plant Functional Type (PFT). A better description of the agricultural land is needed to enlarge the accuracy of the model (especially at high resolution) and their range of application (land use studies, climate change...). For example in temperate region, the C3 crops have two different seasonal cycles with a peak LAI in spring or in summer depending on sowing date. A larger number of agricultural PFT have been recently introduced in the ISBA-A-gs land surface model within the SURFEX modelling platform. The SURFEX modelling platform is used in a wide range of applications either in coupled mode or in off-line mode (driven by meteorological forcing).
The number of agricultural PFT have been increased from 3 (C3 crops, C4 crops, irrigated C4 crops) to 8 (C3 winter crops, and C3 summer crops both irrigated or not; C4 crops; C4 irrigated crops). The objective is not to implement a full agronomic model but to introduce simple parametrisation which account for the broad differences between these classes. For example summer C3 crops have a prescribed emergence date parameter that differentiate them from winter C3 crops. The irrigation introduced in an earlier version of ISBA-A-gs is based on a simple empirical model based on threshold of soil moisture.
We will test the new version of the model over France in a configuration close to the one used by the GEOLAND2 Land Carbon project. The simulations are performed with the high resolution meteorological forcing (8km) SAFRAN over a period of 20 years.
We compare the simulated LAI over France with the GEOLAND2 LAI product derived project from the SPOT/VEGETATION sensor. Finally, we discuss the improvement in seasonal cycle and inter-annual variability bring by the new PFTs.