

# ***Interactive comment on “Agro-hydrology and multi temporal high resolution remote sensing: toward an explicit spatial processes calibration” by S. Ferrant et al.***

**S. Ferrant et al.**

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Dear Editor and second referee,

We would like to thank the second referee for his/her review that will help us improving the manuscript. We agree with all the comments. Please find below a point to point answer that will be used to modify the manuscript.

1. We will modify the manuscript following the recommendations made by the two referees and forward it for English correction to a native English speaker.
2. HSTR means “High Spatial and Temporal Resolution”, which stands for the deca-

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metric spatial resolution of satellite images that will be acquired for short time of revisit.

3. The PET is computed from Penman-Monteith equation.

4. The referee points out a problem that we will clarify in the material and method: A hydrological period 2005-2010 is used for running the model. Satellite images are available from 2006 to 2010. The first year is used as hydrological initialization and is not subject to crop cover calibration as no satellite data are available.

5. “Ref?” is a missing reference that is still missing. Since the classification results have not been published before, we will remove this.

6. The right term is “Emergence date”.

7. This sentence needs to be clarified: NSE has been used for fluxes calibration as it is usually done in hydrological modeling. RMSE were used as a second performance indicator.

8. In Ferrant et al., 2011, the comparison of two similar agro-hydrological model SWAT and TNT2 suggested that one major reason behind these poor hydrological simulation performances is linked to the dominant contribution of surface runoff to the discharge, which highly impacts the NSE. These infra-daily fast transfer are highly influenced by the surface soil roughness, itself highly impacted by the clay-ish material composing the soil (40%). Surface cracking during dry period and preferential flowpath resulting from soil erosion are not taken into account in the daily estimation of runoff from TNT2 modeling approach.

9. We will correct this, thank you.

10. We will try to improve this in the next version of the manuscript.

11. We agree. The equation describing the growth of the LAI is shown in Fig1 and depends on the cumulative daily temperature  $\Sigma T$ .  $K_n$  and  $K_x$  stand for respectively for the minimum and maximum of the interpolated LAI.  $T_i$  and  $T_f$  are respectively the cumu-

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lative temperature when the LAI reaches  $Kx/2$  during the growth and the senescence phases. Both parameters  $a$  and  $b$  correspond to the local slope for the temperature  $T_f$  and  $T_i$ .

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Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 11, 7689, 2014.

**HESD**

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