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Hydrology and Earth System Sciences
Discussions

Interactive comment on "The WACMOS-ET project – Part 1: Tower-scale evaluation of four remote sensing-based evapotranspiration algorithms" *by* D. Michel et al.

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Thanks Kevin for your positive comment about the paper. Regarding your questions about our use of your model, we tried to mantain as much as possible the original relationships used by PT-JPL. As the project forcings did not include NDVI but LAI, we use the scaled LAI and an inversion of the model equations relating NDVI, fIPAR and LAI so those values are related as defined originally in the model. Same for SAVI, we did not have that as a forcing, so we invert the equation relating SAVI and scaled FAPAR to conserve the original relationship. So I think that there are no any issues concerning how we apply the model: the SAVI-FAPAR and NDVI-FIPAR relations are

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maintained, and are based on “expected” (read “MODIS-like” after the scaling of the JRC products) SAVI and NDVI values. We can clarify this in the revised version of the article.

Although we do not use our MODIS-scaled FAPAR as a FIPAR, the discussion about JRC FAPAR being more a FIPAR than a FAPAR and the implications of scaling the JRC FAPAR to MODIS expected values is of interest. Certainly other factors than clumping may be affecting the MODIS-JRC FAPAR difference, but without additional assumptions (or information) assuming than the 1- and 3-D RT schemes (i.e, the clumping issue) are responsible for a large fraction of the differences seems reasonable. Sure we agree with the comment of two canopies with the same fAPAR can have different LAI, but the converse (same LAI but different FAPAR) is also possible. By its very nature, the clumping (regardless of view angle) implies increased shading within the canopy i.e. more multiple scattering, hence different direct/diffuse and, potentially, different absorption. The subject is definitely complicated.

Regarding the validity of the scaling, we looked at MODIS-JRC FAPAR comparisons over a selection of stations representative of different biomes (see the validation report at www.wacmoset.eu). The MODIS-JRC FAPAR correlations were high at a considerable number of stations, suggesting than a scaling is a reasonable (but not perfect by any means) method of making these two products more alike. Certainly this is a pragmatic approach in order to run the project ET models. It would have been better to rethink the model relationships so the model could ingest the 1-D RT vegetation properties, but that was out of the scope of the project.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 12, 10739, 2015.