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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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Nice job and particularly informative for the sub-daily resolution. I have a few comments and questions:

Its not clear how FIPAR is determined in PT-JPL. This is important because this model distinguishes between light intercepted by green (FAPAR) and total (FIPAR) canopy fractions, but its not clear the present application maintains this feature of the model's parameterization. In an attempt to distinguish between FAPAR and FIPAR, PT-JPL originally used SAVI and NDVI, respectively. The idea being that SAVI is more related to FAPAR while NDVI is more related FIPAR. This is consistent with the radiative trans-

fer analysis of Zhang et al. (2005; RSE 99:357-371) that looked at this issue. MODIS FAPAR is generally more related to interceptance by the total canopy (FIPAR) rather than the green fraction (FAPAR). This is also the case for NDVI, consistent with the MODIS back-up algorithm being based on NDVI.

Without distinguishing between green and total light interceptance, the analysis runs the risk of overestimating ET in canopies with high amounts of non-green leaf area, such as evergreen needleleaf forests, or during drought stress if the leaves turn brown but are still present. JRC FAPAR is generally (at least it was several years ago) consistent with MODIS EVI, and by extension SAVI. If JRC is adjusted to MODIS FAPAR, this overestimation problem will then be transferred to JRC FAPAR. Aside from IT-Noe, this looks to be the case for the results found for UW-Wrc, CA-ojp and CA-Qfo.

The adjustment illustrated in Figure 1 seems reasonable for LAI, but not for FAPAR. The reasoning presented for adjusting the JRC to match MODIS seems to be based on the different treatments of clumping by each approach. While adjusting for this seems logical for LAI, does this make sense for FAPAR? Shouldn't the adjustment for clumping be made to LAI only? Viewed from nadir, canopies with and without clumping could have identical FAPAR, while their LAI could differ as a result of clumping. Is it possible that differences in FAPAR between JRC and MODIS are due to the aforementioned issue of JRC being more diagnostic of the green canopy fraction (and thus more related to EVI) while MODIS is more diagnostic of the total (and thus more related to NDVI)?

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