**Hydrology and
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Discussions

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Interactive comment on "Estimating Daily Evapotranspiration Based on a Model of Evapotranspiration Fraction (EF) for Mixed Pixels" *by* Fugen Li et al.

Anonymous Referee #2

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General comments 1) I find it strange that no reference is made to the only widely accepted disaggregation method currently producing high resolution ET: ALEXI/DISAlexi. 2) The biggest concern I have with your approach is that your approach specifies two hypothesis that are used to upscale. However in this there is (in my opinion) two serious flaw: a. An underlying assumption (that is not specified) is that the evaporative fraction at coarse resolution is correct. Considering that this evaporative fraction was determined over a coarse resolution (without considering subsurface heterogeneity) in the first place. As such oasis effects are not taken into account and can result in serious errors. b. Secondly, hypothesis 1 (having EFi = EF) only is valid for incoming radiation (optical and thermal). However considering that the outgoing radiation

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depends on LST, albedo and emissivity (each with greatly varying heterogeneity) this cannot be said for the net radiation consequently on the available energy. While for many agricultural site's the application might hold true, it cannot be stated as an over-arching law. While this is kind of reflected in the text (as you change denotation from LE to LE~), the is not further touched upon at all. c. While for hypothesis 2 at least some justification is provided (though one can argue what objectively is specified as 'near', no justification/argumentation for the 1st hypothesis is given. d. Finally, at 30m resolution horizontal transport is becoming much more important (as you yourself indicate when considering EC footprints). Specific comments 1) These shortcomings are reflected in that for EC4 (your most successful disaggregation site) still an error (2.7MJ) a factor 2 above any of your homogeneous sites (EC2,6,12 and 14) (each with errors below 1.2 MJ). This however is not touched upon in the text. Technical comments 1) Specifically figure 4 and 5. Here you want to show the difference between Lumped and EFAF (LE/EF) next to each other. In my view this could be better shown by 1 graph of Lumped LE/EF, and a 2nd showing the difference between Lumped and EFAF (LE/EF). At present the colouring of the maps hide where specific improvements are made. 2) You denote the validation-results in MJ/m2 instead of the customary mm/day. While this is simply a division by the latent heat of vaporization, denoting it in these units prohibits the comparison with other validation researches. 3) Also in the start of the manuscript you refer to results of intercomparison studies as 'biases' (while they should have been called errors/uncertainties), while you specify (in fiture 4.3) errors which cannot be qualified as such (as they do not refer to a comparison between ground measurements and retrieval), but instead are just variances of a single map.