

Major comments

This scientific quality of this note is overall okay, and its contents are moderately interesting and marginally useful for the kind of research or context presented in the paper (micrometeorological or water balance research). It may be useful for irrigation planning or garden water use monitoring, but I am not at all convinced that it marks a “watershed moment in hydrology”.

My reservations relate to the fact that:

- generally instantaneous values of weather variables and ET estimates are less useful than hourly values integrated to e.g. daily values. No operator is going to stand in the field for 24/7 to take these measurements.
- the IR phone images are only useful if one is interested in spatial variability of ET. Perhaps it can be useful for small-scale investigations of ET variability, e.g. in urban settings.
- As I said, no operator is going to stand in the field for 24/7 to take these measurements. Why not buy a cheap weather station, e.g. and Ecowitt one, which is barely more expensive than the WEATHERmeter and supplement it with a cheap surface temperature sensor?
- In fact, how well would the model have done with T_a only and not T_s ? Do we really need T_s ? Can this be tested and discussed?
- This approach is only useful if there are high-quality ET data (e.g. EC-data) available to calibrate the ML model. For most places and users these are not available, and I am not sure how we would get around that. Unless we used cloud free high-resolution ET estimates to calibrate the ML models for specific settings, where lots of hobbyist weather station data are available.
- What about emissivity? Do the T_s data not need to be corrected for that? And the fact that the measurements are only measured between 8 and 14 micrometer(?).

Specific comments

Line 24: “Traditionally, ET has been measured through the mass-balance principle applied to catchments or lysimeters”. This statement could be expanded a little to help the reader and needs some references.

In fact the whole paragraph between line 24-32 is devoid of any references. This needs fixing.

Line 29: Replace “thermal infrared window”, by “thermal infrared atmospheric window of the electromagnetic spectrum”

Line 58: Say: “model CAT S62 Pro; referred to as S62 from hereon)”

Line 59/60: Explain better what is meant by saturation here, and what causes this? Why these 2 layers of paper, this sounds rather arbitrary.

Line 61: Also, what is meant by “phone held straight-up perpendicular to the sun”. You mean that the phone is held vertically? Refer to Fig.1a here? Also, why are you taking a photo of obstacles sitting on the surface, rather than of the actual land surface? I find this confusing. Surely, this angle is only suitable/crucial for the operation of the light sensor, not for the IR image?

Line 64 & 65: use subscripts for T_a and w_s (and for T_s in line 62). You use them later in the equation.

Line 70-71: You say “partitioning of incoming solar radiation into evapotranspiration and sensible heat”. It is net radiation that is partitioned into evapotranspiration and sensible heat, but also into soil heat flux. So, this statement is incorrect. Also “incoming solar radiation” is the same as “global radiation”. Do you want to stick with one term? The latter one is less intuitive.

Line 71: “Both can be measured by phone’s internal sensors..” What does “Both refer to here?”

Line 80-81: Can a little bit more information be given here? “The smartphone and Büel observations are available from Teuling and Lammers (2023)”. How many measurements/ IR images were taken in the field, and of what kind of surface? Only in the footprint of the EC mast or ‘on the lysimeter’?

Line 89: This equation needs a number. Also, the various alphas are not defined properly? Nor is parameter c ? Why is pressure not considered? If that is the case, then take it out of the rest of the paper.

Line 135-136: What is meant with “.. magnitude of the offset term”. Is this the parameter c in the equation?

Technical corrections

Line 39: It should be “Hukseflux” not “Hukseflux”.

Line 85: It should be “...a lack of energy balance closure”

Line 130: ‘it should be **negligible** role’.

Line 132: It should be “these conditions”