

Comments to Author:

Title: Very-High-Resolution, Multi-Season Monitoring of Crop Evapotranspiration and Water Stress with UAV Data and TSEB Integration

1. Major Comments

- i. Line 13 and 149: Although UAV technology offers extremely high-resolution data, it is important to recognize that the TSEB model, like most resistance-based energy balance models, must be applied over an appropriate spatial domain to satisfy its physical assumptions and underlying formulations. Consequently, TSEB cannot be applied at the leaf level; the radiative transfer and turbulent exchange processes on which it depends require the model to be run at spatial resolutions of the order of meters. The 15 cm resolution of multispectral and thermal imagery used for running TSEB may need stronger justification for its selection. Evapotranspiration maps are helpful for irrigation management; however, 15 cm resolution may not be feasible for practical irrigation applications.
- ii. Line 162-163: The radiometric sensor calibration and imagery correction are important for reliable LST data. Cited a reference and explained how the calibration parameters were used in the calibration?
- iii. Line 174-181: Was a thermal infrared sensor or similar used to measure LST from the ground-based reference targets? Later, it stated that a multiple regression model was developed, but it is unclear how the ground temperature was measured and how the environmental variables were used to generate the model.
- iv. Line 193: There is a lack of understanding of the terms: 1) fractional vegetation cover, 2) vegetation fractional from the viewing angle, and 3) fraction of green LAI. Also, there is an error in naming the terms throughout the paper; for example, at line 193, fractional vegetation cover was labeled FVC, and equation B1 shows the calculation of the green area index. Similar for line 221.

643 **B1. Green area index (multispectral)**

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$$FVC = \frac{NDVI - NDVI_s}{NDVI_v - NDVI_s} \quad (B1)$$

645 with $NDVI_s$ being the upper threshold for NDVI values representing soil pixels and $NDVI_v$ representing the upper
646 threshold of healthy vegetation.

Table 1 shows the model input; however, the fractional cover listed in equation (A10) is based on vegetation fractional cover viewed from an angle, which differs from the fractional cover calculated from multispectral data using soil and canopy pixel classification. Revise the original paper of TSEB formulation.

Figure 4 shows equation A10, which is not related to the PT equation

- v. Line 362: TSEB model compute the surface energy fluxes R_n , H , G and LE or ET is calculated as a residual from the energy balance, in order to evaluate the outputs from TSEB model it is also necessary to compare the modeled and measured R_n , H and G . Additionally, TSEB model output are based on closed energy balance and EC data are non-closed energy balance it is recommended to compare for both scenarios: energy balance closed and non-closed.
The crop water stress can be derived from TSEB outputs. The paper does not present a method for assessing crop water stress.
The following paper explains a method to get CWSI from TSEB
<https://doi.org/10.1016/j.jag.2025.104737>Assessment of different remote sensing techniques to estimate the CWSI of almond trees using canopy temperature.
- vi. Line 545: A Daily ET map is needed for irrigation scheduling, and an extrapolation technique using weather data can be used to upscale from hourly to daily ET . However, soil moisture and rainfall data are required for irrigation scheduling. In the literature, extrapolation techniques were assessed for ET derived from UAV data.
- vii. Using high-resolution UAV imagery allows for canopy and soil temperature pixel separation. TSEB-2T, using canopy and soil temperatures, reported better results than TSEB-PT. TSEB-2 T does not consider Priestley-Taylor formulation initialization. Why was the criterion to use TSEB-PT having high-resolution imagery?
- viii. How was the shadow managed in the multispectral and thermal imagery, and how was the impact on TSEB results?

2. Minor Comments

- i. Line 42: The citation is missing a parenthesis
- ii. Line 115: Adding the flux footprint of the EC tower may explain the predominant winds on the study site
- iii. Line 236: Net radiation (R_n) is not the same as incoming solar radiation; line 147 shows incoming solar radiation as R_n
- iv. Line 293: there is no plot b) correlation of weather conditions with the difference (Δ) between the thermal sensor and actual temperature of ground thermal targets for each date.