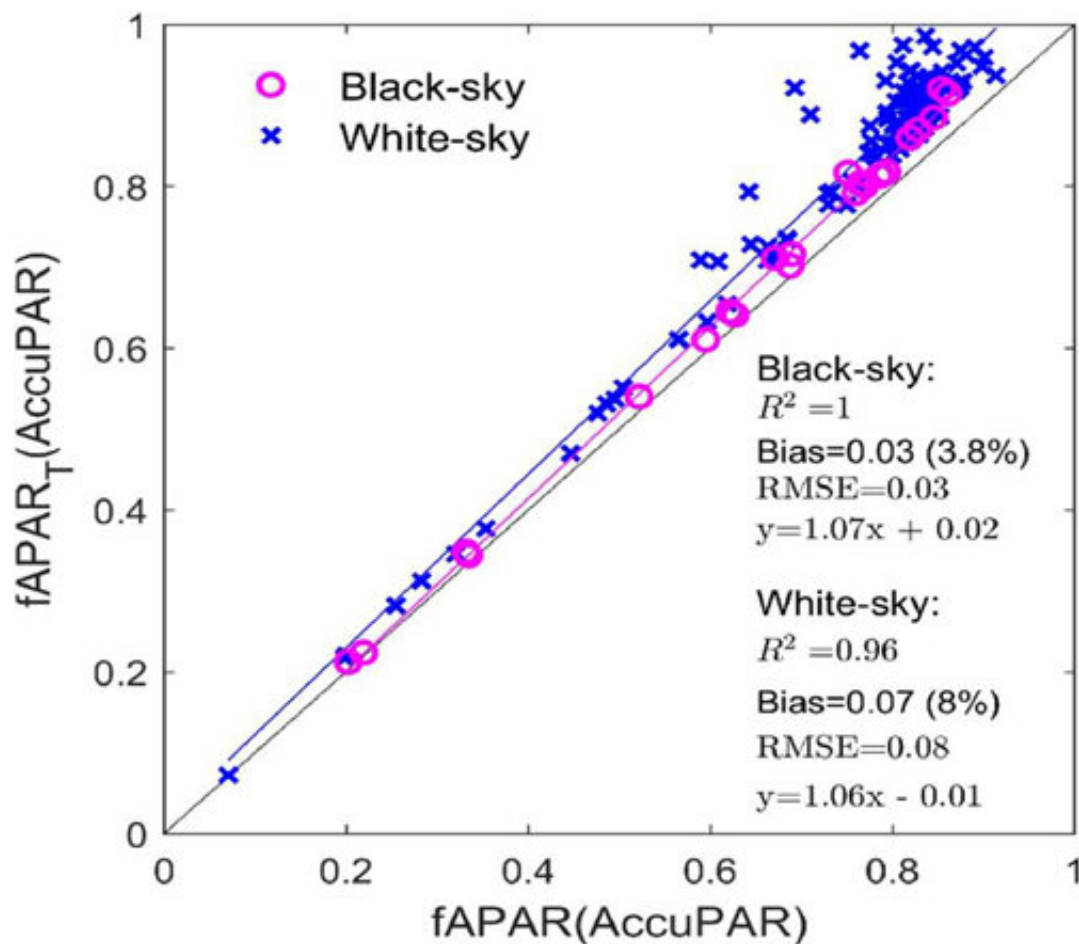


Proper methods to estimate fraction of absorbed photosynthetically active radiation for vegetation

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Comparison of the AccuPAR estimated four-stream fAPAR and the two-stream fAPART under black- (magenta) and white-sky (blue) conditions. Credit: IGSNRR

Continuous and accurate ground measurements of the fraction of absorbed (fAPAR) or intercepted (fIPAR) photosynthetically active radiation by green canopy components is important to monitor canopy functioning.

Several methods have been proposed in the [field measurements](#), such as the PAR ceptometer (AccuPAR), Plant Canopy Analyzer (LAI-2200), and digital hemispherical photography (DHP). However, the differences in the methods and the impact of solar illumination and non-green components in the measurement are still unclear.

Dr. Li Wenjuan and Prof. Fang Hongliang from the Institute of Geographic Sciences and Natural Resources Research (IGSNRR) of the Chinese Academy of Sciences and their cooperators analyzed several methods estimating the fraction of absorbed or intercepted photosynthetically active radiation from ground measurements and found proper ones.

They conducted two field campaigns over paddy rice fields in northeastern China in 2012 and 2013, and made seasonal continuous fAPAR measurements using, AccuPAR, LAI-2200, and DHP, with the field data collected.

The results showed that the fraction of intercepted PAR (fIPAR) measured with AccuPAR, DHP, or LAI-2200 was a good proxy of the fAPAR computed with the four-flux method from AccuPAR.

The researchers recommended using the downward looking DHP to measure the green fAPAR when [canopy](#) becomes senescent because the method is capable of identifying the green pixels automatically.

The study was published in *Agricultural and forest meteorology*.

More information: Wenjuan Li et al. Critical analysis of methods to estimate the fraction of absorbed or intercepted photosynthetically active radiation from ground measurements: Application to rice crops, *Agricultural and Forest Meteorology* (2020). [DOI: 10.1016/j.agrformet.2020.108273](https://doi.org/10.1016/j.agrformet.2020.108273)

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