

Abstract

- 1) [See: track changes document: L639-684](#)

OK

- 2) [See: track changes document L417 and L594](#)

I have some doubts concerning equation 1 (L417)

- How can a calibration factor be unitless? Or is it just a multiplicative gain-type factor?
- If R_{sensor} is the spectral response, it also should have absolute units, otherwise it is just a *relative* spectral response.
- On the form of the equation: if the wavelength dependence of R_{sensor} is expressed - $R_{sensor_i, \lambda}$ – so should be the case for $T_{diffuser}$ and T_{filter} .

- 3) [See: track changes document: changed to GHI](#)

OK

- 4) [See: track changes document: added in line 554](#)

The remark refers to line 19. There is no mention of dark current nor zero offsets at line 554. Please verify back line 19.

- 5) [See: track changes document line 23-24](#)

OK

1. Introduction

- 6) [In line 55 we state: "..., and temperature sensitivity".](#)

OK

- 7) [See: track changes document: Michalsky et al, \(1991\) reference was missing and added in L737-738. They only provide rms errors.](#)

OK

- 8) [See: track changes document L56](#)

OK

9) We prefer inserting a reference containing such a Figure. See Fig. 1 of Alados-Arboleda et al., 1995.

OK

10) This was developed in lines 73-79

OK

2.1 Light Sensor

11) The more specific term for our sensor would be a “filter-based spectrometer”, but it still qualifies as a spectrometer. We will clarify this in line 132. The filters are already described in line 136. See: track changes document: L89: added “filter”

In order to qualify as spectrometer, an instrument should measure a wavelength dependent quantity (units \sim W.m $^{-2}$.nm $^{-1}$). FROST is measuring integrated signal in 18 different wavebands (units \sim W.m $^{-2}$). Please note that this is in no way diminishing FROST instrument general quality. It is just a matter of correctness of radiometric definitios.

I advise to revise several instances of document in the sense of denominating FROST as a multi-channel radiometer rather than a spectrometer.

12) No, there are no 3 bands, no RGB bands. The Red, Green and Blue are used to identify each of the 3 light detection chips. Each chip detects 6 light wavebands. The manufacturer (AMS) also identifies the 3 chips using the same color coding. We understand that this may sound confusing. Line 135 should clarify this, but based on the reviewer's comment, more info is needed.

See: track changes document: color coding improved, see Figs

I don't understand if this was corrected as there is no information concerning this on line 135.

13) See: track changes document L157 and added +/-10 nm center-wavelength specification

OK

14) See: track changes document L669-671

OK

2.1 Diffuser material

15) See: track changes document: L169-170

OK

16) See: track changes document L171-172

OK

3.1 Spectral response and temperature sensitivity

17) See: track changes document: technical specs updated, Fig. 5 caption expanded, added L262-266

OK

18) See: track changes document: Fig. 6a added

OK

19) See: track changes document: L273-276

OK

20) We will provide an xy Figure to show the quality of the comparison (supplementary materials)? Unfortunately the experimental data could not be retrieved

OK, but the method should be briefly explained nonetheless

21) See: track changes document: L279-280

OK

22) See: track changes document: L279-280

OK

23) See: track changes document: some rearrangements and additions: L284-307

OK

24) See: track changes document: improved Figs. 5, 6b, changed: L348-352

OK

25) See: track changes document improved Fig. 8

OK

26) See: track changes document: Line removed and L385 Figure references added

OK

27) See: track changes document: L418-436 and new S1.

OK

28) See: track changes document: improved Table 2

OK

3.3 Cosine response and GHI

29) The FROST cannot decouple diffuse radiation from GHI.

OK

30) Agreed, we will add relative units also and improve Figure 13, 14 and 15 captions

The error is still shown in absolute units [W.m-2]. I think it would be more readable if it is given in percentage.

31) See: track changes document: All Figs. 13-15 and Fig. captions improved

OK

32) See: track changes document: improved Fig. 15

OK

33) See: track changes document: L505-506

OK

34) See: track changes document: L507 added and Figure caption improved

OK for changes in Figure 16. But I would still strongly recommend including a mathematical expression.

3.4 Spatial measurements and synchronization

35) We think it is nice to show this as a Figure since it directly visualizes the perfect synchronization, the fast response speed and no zero offset (or dark current)

OK

3.5 Photosynthetic Active Radiation

36) Measurements of PPFD intensity

OK

37) Removing (per W m⁻² nm⁻¹) solves this confusion

OK

38) • line 486: wavelength (λ_n)

Can't trace this in the text

39) See: track changes document: New Eq. 1

OK

40) See: track changes document: Improved Table 2

OK

4 Discussion

41) Agree, the major factor would be the limited coverage of the PAR band due to narrow band response of the 11 bands.

Where is this overview given?

Technical corrections

42) • line 100: verify autor name. Probably Lopes Pereira.

Not fully done Peirera => Pereira