Package 'fluspect'

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Type Package

Title Fluspect-B

Version 1.0.0

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Description A model for leaf fluorescence, reflectance and transmittance spectra. It implements the model introduced by Vilfan et al. (2016) <DOI:10.1016/j.rse.2016.09.017>. Fluspect-B calculates the emission of ChlF on both the illuminated and shaded side of the leaf. Other input parameters are chlorophyll and carotenoid concentrations, leaf water, dry matter and senescent material (brown pigments) content, leaf mesophyll structure parameter and ChlF quantum efficiency for the two photosystems, PS-I and PS-II.

License GPL-3

Encoding UTF-8

Depends R (>= 2.10)

Imports pracma, utils

LazyData false

RoxygenNote 6.1.1

NeedsCompilation no

Repository CRAN

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R topics documented:

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define.bands   *define.bands*

Description

`define.bands` defines the spectral regions for the Fluspect-B model

Usage

```
define.bands()
```

Details

Define spectral regions for SCOPE v_1.40
All spectral regions are defined here as row vectors
WV Jan. 2013

Value

a spectral object.

Author(s)

Nastassia Vilfan, Christiaan van der Tol, Onno Muller, Uwe Rascher, Wouter Verhoef (Original version in Matlab)

Alberto Hornero (Ported version into R)

Examples

```
spectral <- define.bands()
```

---

fluspect   *fluspect*

Description

`fluspect` calculates reflectance and transmittance spectra of a leaf using FLUSPECT-B, plus four excitation-fluorescence matrices

Usage

```
fluspect(leafbio, spectral = define.bands(), optipar = NULL)
```

Arguments

`leafbio`	Data Frame. It contains: Cab, Cca, Cw, Cdm, Cs, N, fqe
`spectral`	List. (Optional) A spectral object created with define.bands. A default spectral object is used if the user does not indicate any.
`optipar`	Data Frame. (Optional) It contains: nr, Kdm, Kab, Kca, Kw, Ks, phiI, phiII. A default optipar object is used if the user does not indicate any.

Details

More information: Fluspect-B: A model for leaf fluorescence, reflectance and transmittance spectra. Vilfan et al., 2016

Original version in MatLab: github.com/Christiaanvandertol/Fluspect

Value

a list which contains:

- refl (reflectance)
- tran (transmittance)
- Mb (backward scattering fluorescence matrix, I for PSI and II for PSII)
- Mf (forward scattering fluorescence matrix, I for PSI and II for PSII)

Author(s)

Nastassia Vilfan, Christiaan van der Tol, Onno Muller, Uwe Rascher, Wouter Verhoef (Original version in Matlab)

Alberto Hornero (Ported version into R)

Examples

```
leafbio <- data.frame(Cab = 70, Cca = 30, Cw = 0.013, Cdm = 0.024, Cs = 0.0, N = 4.09, fqe = 0.02)
leafopt <- fluspect(leafbio)
plot(leafopt$refl)
```

---

write.leafopt	*write.leafopt*

Description

`write.leafopt` writes the leafopt object as text files

Usage

```
write.leafopt(leafopt, path, digits = 5)
```

Arguments

leafopt	List. Spectral object generated with [fluspect](#)
path	String. Output path. If the directory does not exist, a new one will be created.
digits	Integer. (Optional) Number of digits (by default 5)

Details

It always writes the text files in UNIX format, under the specified output path. It will override if files already exists. The output filenames are:

- leafoptrefl.txt
- leafopttran.txt
- leafoptkChlrel.txt
- leafoptMbI.txt
- leafoptMbII.txt
- leafoptMfI.txt
- leafoptMbII.txt

Author(s)

Alberto Hornero

Examples

```
leafbio <- data.frame(Cab = 70, Cca = 30, Cw = 0.013, Cdm = 0.024, Cs = 0.0, N = 4.09, fqe = 0.02)
leafopt <- fluspect(leafbio)
write.leafopt(leafopt, path = file.path(tempdir(), 'output'))
```

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