

# Package ‘CanopyPhotosynthesis’

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**Type** Package

**Title** Canopy photosynthesis testbed

**Version** 1.0

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**Author** Jin Wu, Shawn Serbin

**Maintainer** Jin Wu <jinwu@bnl.gov>, Shawn Serbin <:sserbin@bnl.gov>

**Description** Testbed for canopy scaling and modeling of Photosynthesis and GPP

**Depends** XML

**Suggests** testthat

**SystemRequirements**

**OS\_type** Windows, unix, mac

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**LazyLoad** yes

**LazyData** FALSE

**RoxygenNote** 5.0.1

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Func_Canopy_Radiation_Transfer
<i>Func_Canopy_Radiation_Transfer</i>

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## Description

Function for revised DF1997 model to partition canopy LAI into sunlit/shade leaves LAI and partition canopy Vcmax into sunlit/shade leaves Vcmax clumping index was added to original DF1997 model, following the reference from Ryu et al. 2011

**Usage**

```
Func_Canopy_Radiation_Transfer(FLAG, SZA, LAI, Ib0, Id0, Vcmax0_25, CI)
```

**Arguments**

FLAG	Model version controller; 0–Lloyd et al. 2010 Model for Vcmax-LAI relationship; 1–Mercado et al. 2006 Model for Vcmax-LAI relationship in the tropics
SZA	solar zenith angle, in degrees
LAI	Canopy leaf area index
Ib0	direct beam at canopy top
Id0	diffuse irradiance at canopy top
Vcmax0_25	Vcmax at reference 25 centi-degree for canopy top leaves
CI	Clumping index; 0.63 for tropical evergreen forests (Chen et al, 2005)

**Details**

Goal: Use revised DF1997 model to partition canopy LAI into sunlit/shade leaves LAI and partition canopy Vcmax into sunlit/shade leaves Vcmax. Clumping index was added to original DF1997 model, following the reference from Ryu et al. 2011

**Value**

List containing: PAR0 - ; Ib0 - ; Id0 - ; Lsun - Sunlit LAI; Lshade - Shade LAI; Ic - Canopy total absorbed irradiance; Isun - Sunlit leaf absorbed irradiance; Ishade - Shade leaf absorbed irradiance; Vc - Canopy total Vcmax; Vcsun - Sunlit leaf Vcmax; Vcshade - Shade leaf Vcmax

**Author(s)**

Jin Wu  
Shawn Serbin

**References**

dePury and Farquhar, 1997; Ryu et al., 2011

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Func\_Func\_Light\_Partitioning  
*Func\_Light\_Partitioning*

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**Description**

Function to partitioning incident radiation into direct and diffuse radiation, based on the Weiss and Norman, 1985 light partitioning approach

**Usage**

```
Func_Func_Light_Partitioning(SZA, P, PAR)
```

**Arguments**

SWA	solar zenith angle, in degrees
P	air pressure in ??
PAR	measured total PAR?

**Details**

Weiss and Norman, 1985 light partitioning approach

**Value**

List containing: SWA - solar zenith angle, PAR - PAR, SV -  
@references Weiss and Norman, 1985

**Author(s)**

Jin Wu  
Shawn Serbin

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model.options	<i>parse model.options.xml file used to set parameters and other options for model runs</i>
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**Description**

Read model.options.xml file

**Usage**

```
model.options(input.file = NULL)
```

**Arguments**

input.file	model.options.xml file containing information needed for run
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**Author(s)**

Jin Wu, Shawn P. Serbin

**Examples**

```
## Not run:
opt <- model.options()
model.options <- model.options('/home/$USER/model.options.xml')

## End(Not run)
```

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