

# photobiologyFilters Version 0.1.9

## User Guide

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## 1 Introduction

We have developed a set of packages to facilitate the calculation of many different quantities that can be derived from spectral irradiance data. The basic package is called **photobiology**, and the package described here adds transmittance data for some frequently used filters, and a function for interpolating.

## 2 Installation and use

The functions in the package **photobiologyFilters** are made available by installing the packages **photobiologyFilter** (once) and loading it from the library when needed.

To load the package into the workspace we use `library(photobiologyFilter)`.

```
library(photobiologyFilters)

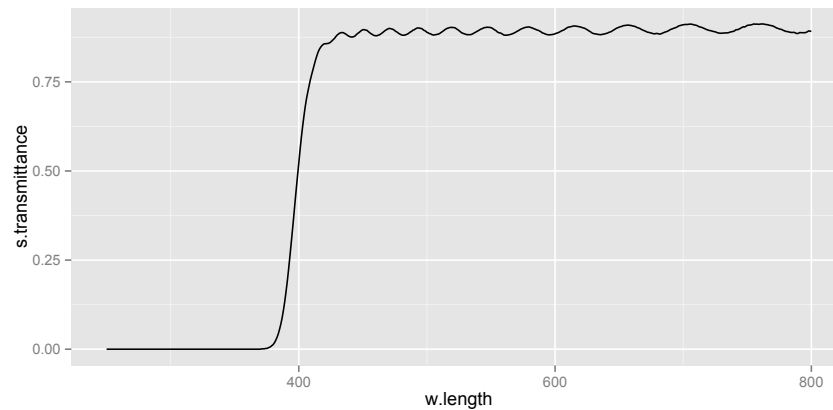
## Loading required package: photobiology
## Loading required package: lubridate
## Loading required package: data.table
##
## Attaching package: 'data.table'
##
## The following objects are masked from 'package:lubridate':
##
##   hour, mday, month, quarter, wday, week,
##   yday, year

library(ggplot2)
```

## 3 Plotting the transmittance spectrum of a filter

```
w.length <- 250:800
s.transmittance <- calc_filter_multipliers(w.length, "uv.226.new")
uv.226.data <- data.frame(w.length, s.transmittance)
rm(w.length, s.transmittance)
```

```
ggplot(data=uv.226.data, aes(x=w.length, y=s.transmittance)) + geom_line()
```



## 4 Convoluting spectral irradiance with filter transmittance

```
data(sun.data)
attach(sun.data)
```

```
canary.s.irrad <- s.e.irrad * calc_filter_multipliers(w.length, "canary.yellow.new")
polyester.s.e.irrad <- s.e.irrad * calc_filter_multipliers(w.length, "polyester.new")
uv.226.s.e.irrad <- s.e.irrad * calc_filter_multipliers(w.length, "uv.226.new")
filtered.sun.data <- data.frame(w.length=rep(w.length, 4),
                                s.e.irrad=c(s.e.irrad, canary.s.irrad, polyester.s.e.irrad, uv.226.s.e.irrad),
                                filter=factor(rep(c("none", "Canary", "Polyester", "#226"),
                                                    rep(length(w.length), 4))))
```

```
ggplot(data=filtered.sun.data, aes(x=w.length, y=s.e.irrad, colour=filter)) + geom_line()
```

