photobiologyFilters Version 0.1.8
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.

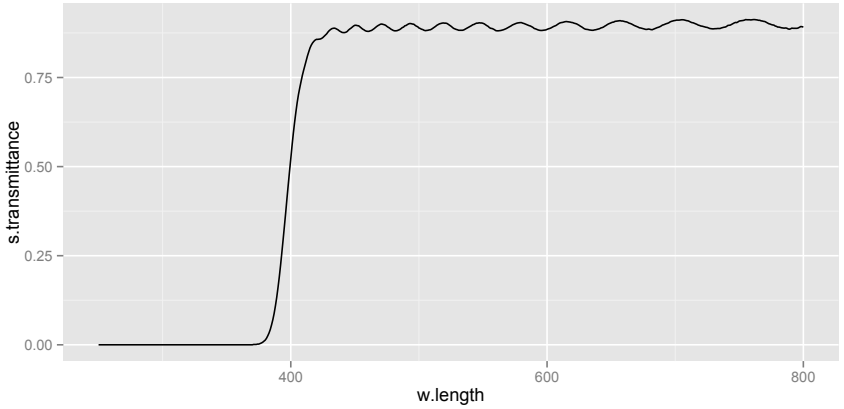
To load the package into the workspace we use `library(photobiologyFilter)`.

```
library(photobiologyFilters)

## Loading required package:  photobiology
## Loading required package:  data.table
## Loading required package:  lubridate
##
## Attaching package:  'lubridate'
##
## The following objects are masked from 'package:data.table':
##
##    hour, mday, month, quarter, wday, week,
##    yday, year
## Warning:  replacing previous import by 'lubridate::hour' when loading 'photobiology'
## Warning:  replacing previous import by 'lubridate::mday' when loading 'photobiology'
## Warning:  replacing previous import by 'lubridate::month' when loading 'photobiology'
## Warning:  replacing previous import by 'lubridate::quarter' when loading 'photobiology'
## Warning:  replacing previous import by 'lubridate::wday' when loading 'photobiology'
## Warning:  replacing previous import by 'lubridate::week' when loading 'photobiology'
## Warning:  replacing previous import by 'lubridate::yday' when loading 'photobiology'
## Warning:  replacing previous import by 'lubridate::year' when loading 'photobiology'

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()
```

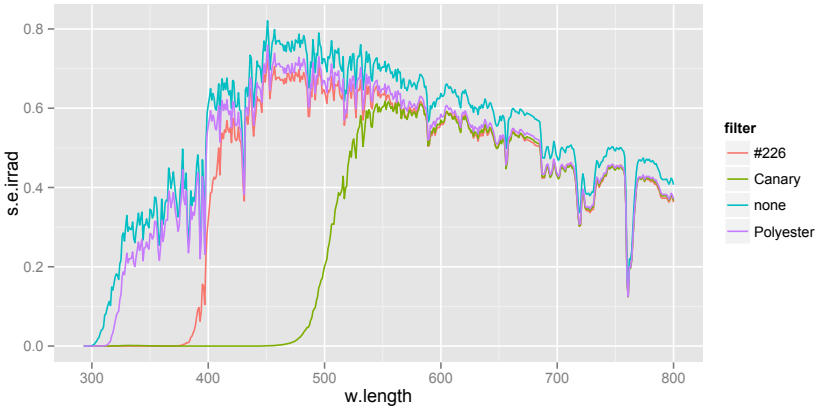


4 Convoluting spectral irradiance with filter transmittace

```
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()
```


0.8
0.6
0.4
0.2
0.0
s.e.irrad
300
400
500
600
700
800
w.length
filter
#226
Canary
none
Polyester