photobiologyLamps Version 0.1.1
Catalogue of LEDs

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June 1, 2014

1 Introduction

We will plot the emission spectra of the different LEDs for which data is provided in the pacakge. We plot the spectra as spectral energy irradiance. All spectra are normalized to an area of one under the whole curve.

```
library(ggplot2)
library(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(photobiologyLEDs)
library(photobiologygg)

## Loading required package:  proto
## Loading required package:  splus2R
## Loading required package:  plyr
##
## Attaching package:  'plyr'
##
## The following object is masked from 'package:lubridate':
##
##    here
```

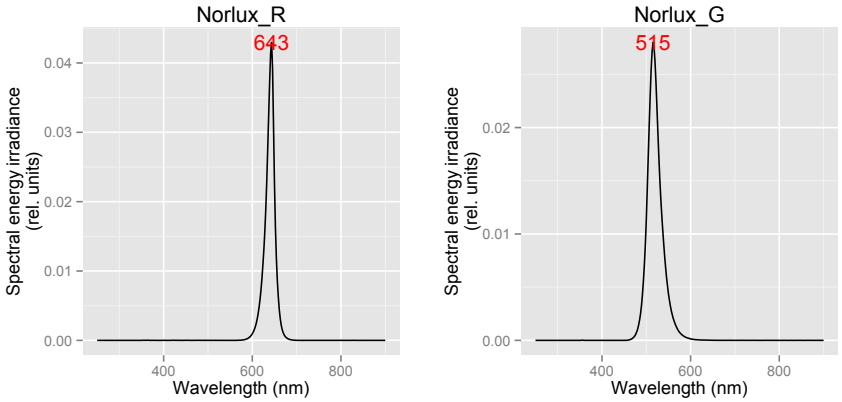
We define a function to do the actual plotting so as to not repeat code, and to make changes easier in the future.

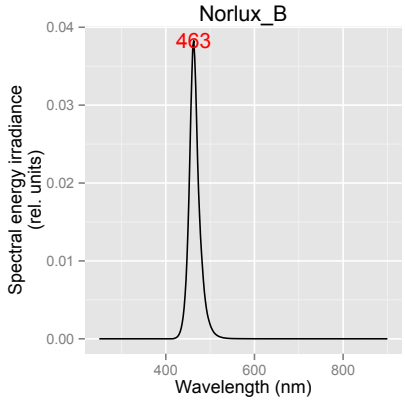
```
lamp.plotter <- function(lamp.name, w.low=250.0, w.high=900.0, scaled="area"){
w.length.out <- seq(from=w.low, to=w.high, length.out=300)
spectrum.data <- calc_source_output(w.length.out=w.length.out, source.name=lamp.name, scaled=scaled, fill=0.0)
spectrum.data <- na.omit(spectrum.data)
fig_energy <- ggplot(aes(x=w.length, y=s.e.irrad), data=spectrum.data) + xlim(w.low, w.high) +
  labs(x="Wavelength (nm)", y="Spectral energy irradiance\n(rel. units)", title=lamp.name) +
  geom_line() + stat_peaks(ignore_threshold=0.33, colour="red")
# fig_photon <- ggplot(aes(x=w.length, y=s.q.irrad), data=spectrum.data) + xlim(w.low, w.high) +
#   labs(x="Wavelength (nm)", y="Spectral photon irradiance\n(rel. units)", title=lamp.name) +
#   geom_line() + stat_peaks(ignore_threshold=0.33, colour="red")
print(fig_energy)
# print(fig_photon)
}
```

2 Norlux LED arrays

RGB array

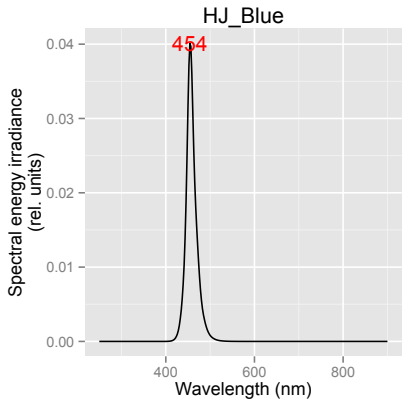
```
Norlux.LEDs <- c("Norlux_R", "Norlux_G", "Norlux_B")
for (lamp in Norlux.LEDs) {
  lamp.plotter(lamp.name=lamp)
}
```





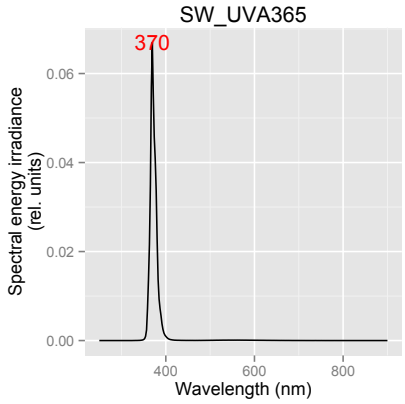
3 Huey-Jann LED arrays

```
HJ.LEDs <- c("HJ_Blue")
for (lamp in HJ.LEDs) {
  lamp.plotter(lamp.name=lamp)
}
```



4 Shezhen Weili LED arrays

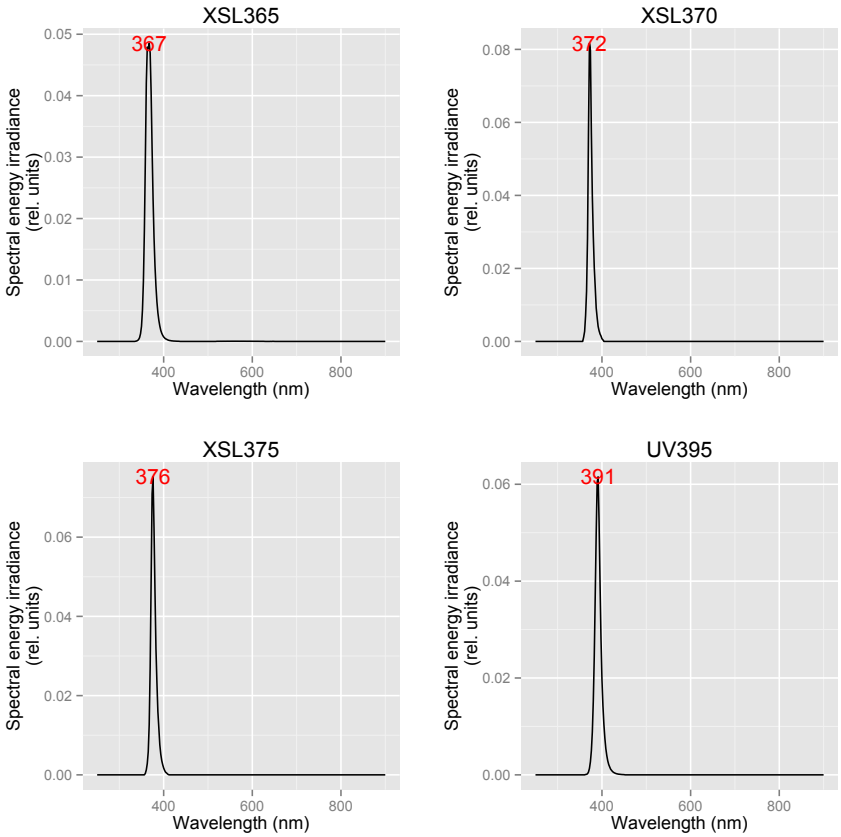
```
SW.LEDs <- c("SW_UVA365")
for (lamp in SW.LEDs) {
  lamp.plotter(lamp.name=lamp)
}
```



5 Roithner Laser LEDs and LED arrays

5.1 UV

```
RL.UV.LEDs <- c("XSL365", "XSL370", "XSL375", "UV395")
for (lamp in RL.UV.LEDs) {
  lamp.plotter(lamp.name=lamp)
}
```


XSL365
367
Spectral energy irradiance (rel. units)
0.05
0.04
0.03
0.02
0.01
0.00
400
600
800
Wavelength (nm)
XSL370
372
Spectral energy irradiance (rel. units)
0.08
0.06
0.04
0.02
0.00
400
600
800
Wavelength (nm)
XSL375
376
Spectral energy irradiance (rel. units)
0.06
0.04
0.02
0.00
400
600
800
Wavelength (nm)
UV395
391
Spectral energy irradiance (rel. units)
0.06
0.04
0.02
0.00
400
600
800
Wavelength (nm)