

# photobiologyLamps Version 0.3.0

## Catalogue of Lamps

Pedro J. Aphalo

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## 1 Introduction

We will plot the emission spectra of the different lamps for which data is provided in the package. We plot side-by-side the lamp output as spectral energy irradiance and as spectral photon irradiance. All spectra are normalized to an area of one under the whole curve.

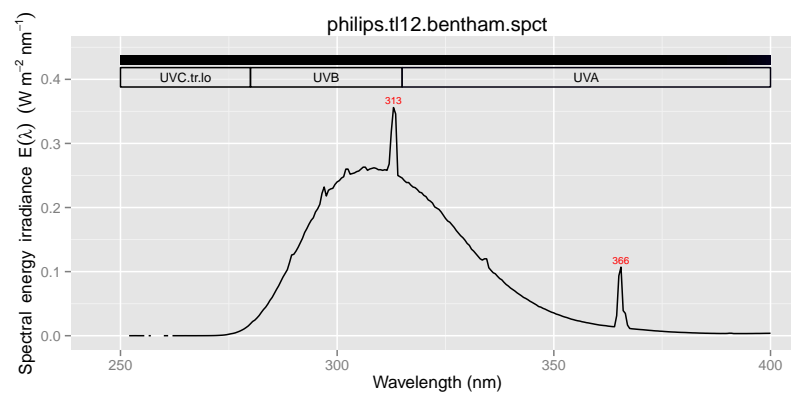
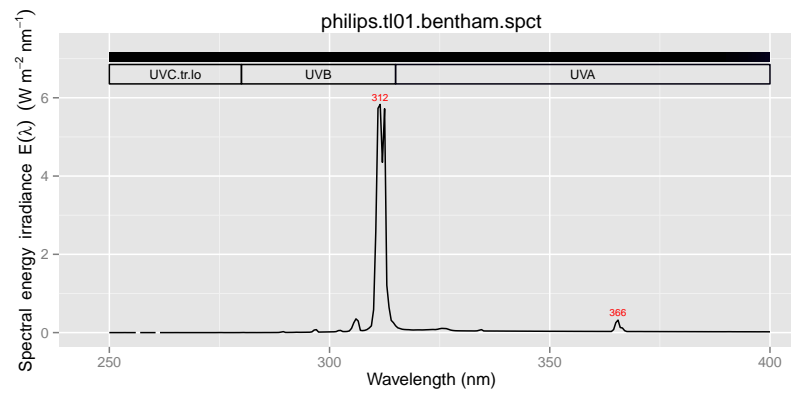
```
library(ggplot2)
library(photobiology)
library(photobiologyLamps)
library(photobiologygg)
```

```
options(photobiology.plot.annotations =
        c("boxes", "labels", "colour_guide", "peaks", "title"))
```

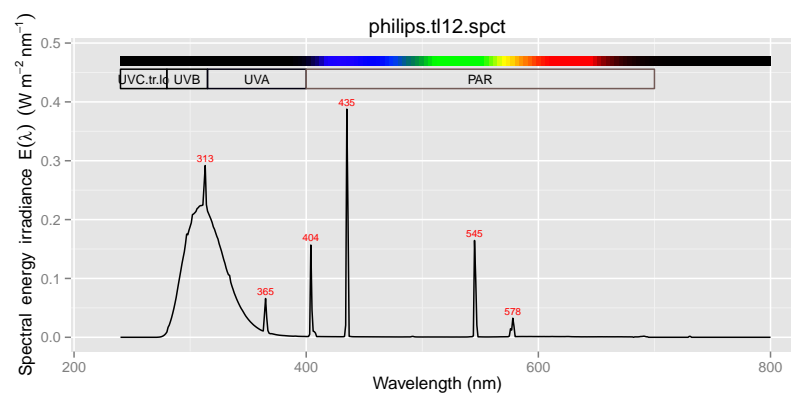
We define a function to do the actual plotting so as to not repeat code, and to make changes easier in the future.

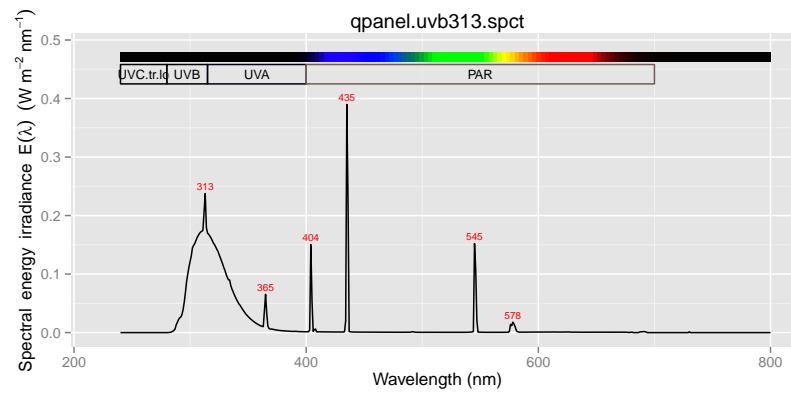
## 2 UV-B lamp spectra

```
plot(philips.tl01.bentham.spct)
plot(philips.tl12.bentham.spct)
```

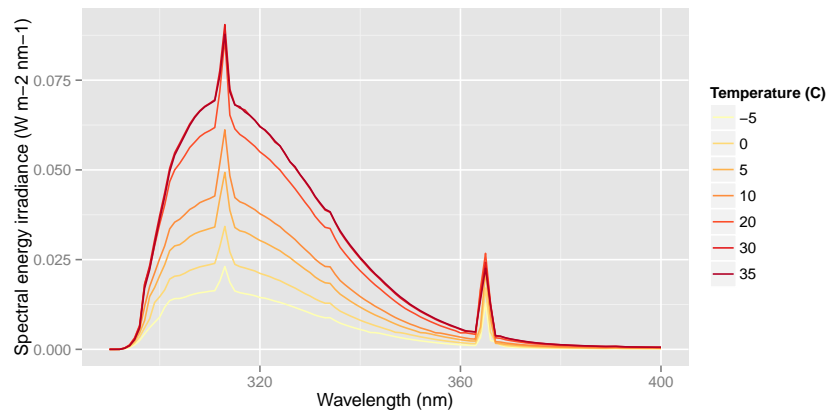


```
plot(philips.tl12.spct)
plot(qpanel.uvb313.spct)
```

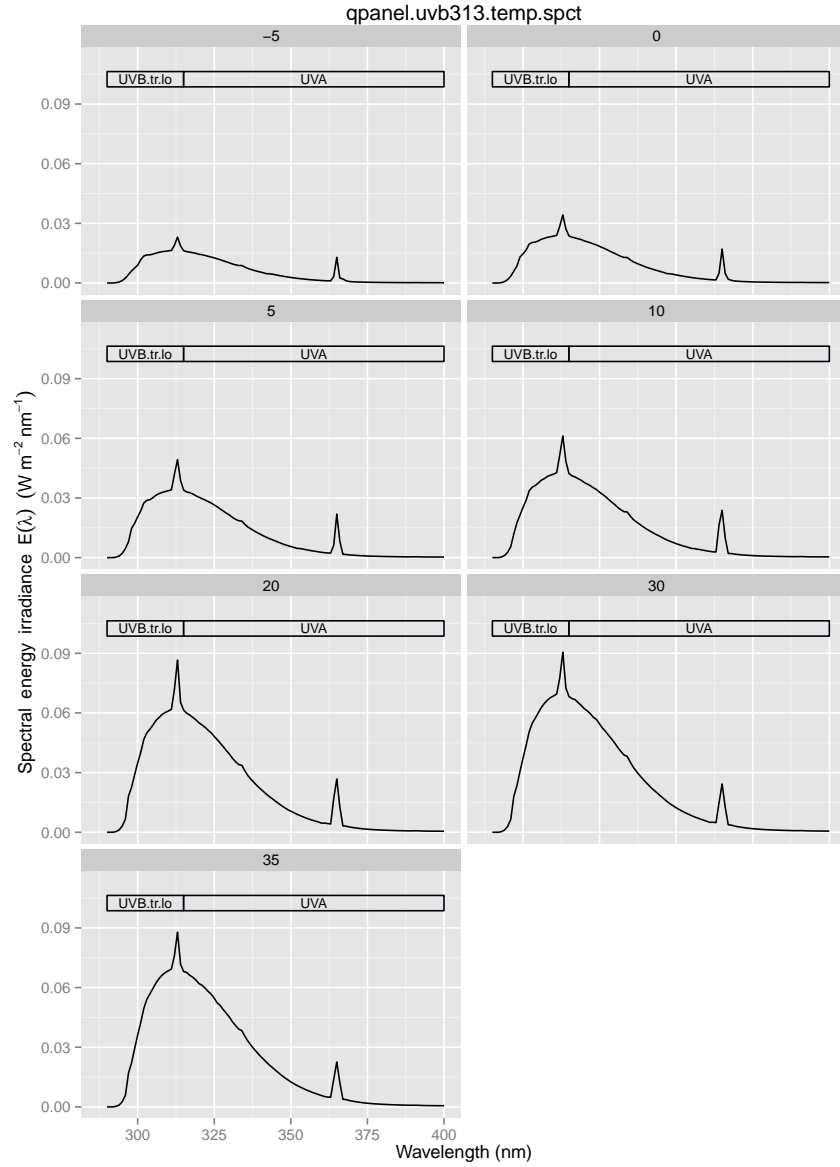




```
fig_temp <- ggplot(data=qpanel.uvb313.temp.spct,
  aes(x=w.length, y=s.e.irrad, colour=factor(temperature))) +
  scale_colour_brewer(type="seq", palette="YlOrRd")
fig_temp <- fig_temp + geom_line() +
  labs(x="Wavelength (nm)", y="Spectral energy irradiance ( $\text{W m}^{-2} \text{nm}^{-1}$ )",
    colour="Temperature (C)")
print(fig_temp)
```

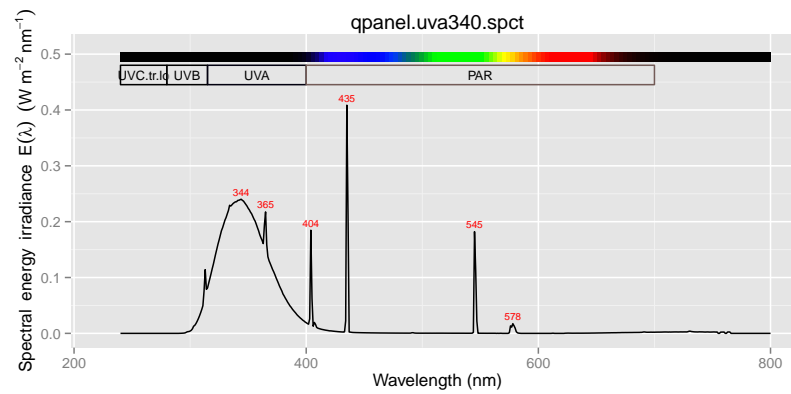


```
invisible(qpanel.uvb313.temp.spct[, temperature := factor(temperature)])
plot(qpanel.uvb313.temp.spct, annotations = c("boxes", "labels", "title")) +
  facet_wrap(~temperature, ncol = 2)
```



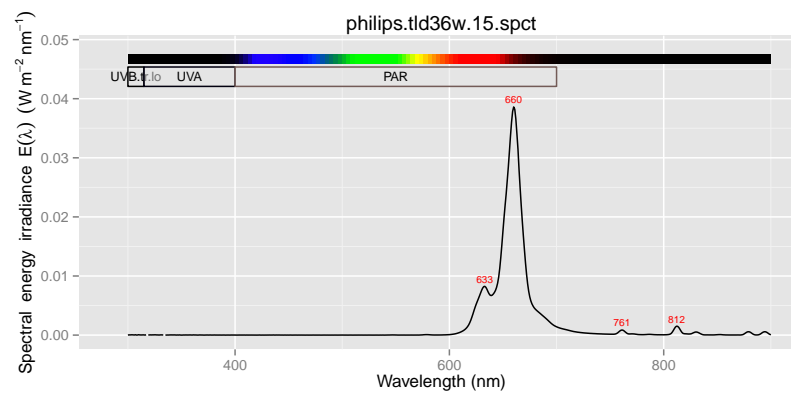
### 3 UV-A lamp spectra

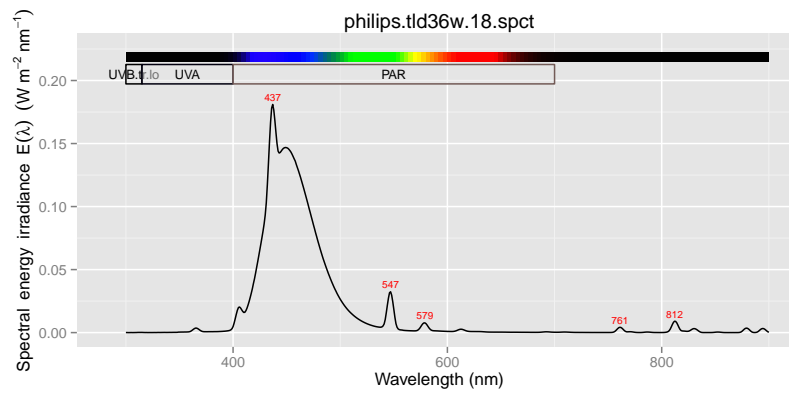
```
plot(qpanel.uva340.spct)
```



### 4 Narrow spectrum VIS lamps

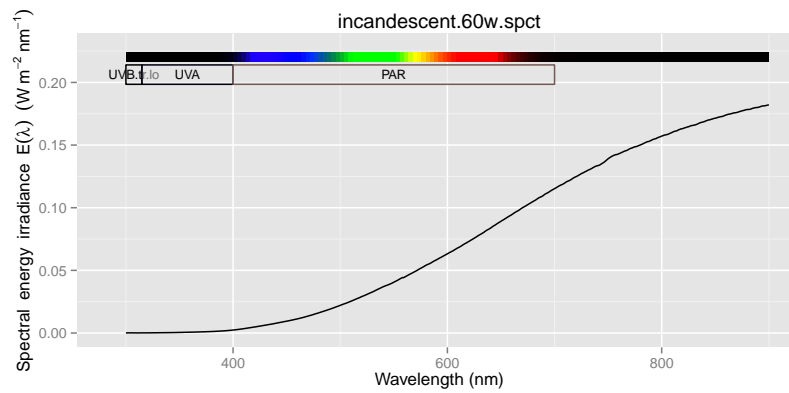
```
plot(philips.tld36w.15.spct)  
plot(philips.tld36w.18.spct)
```

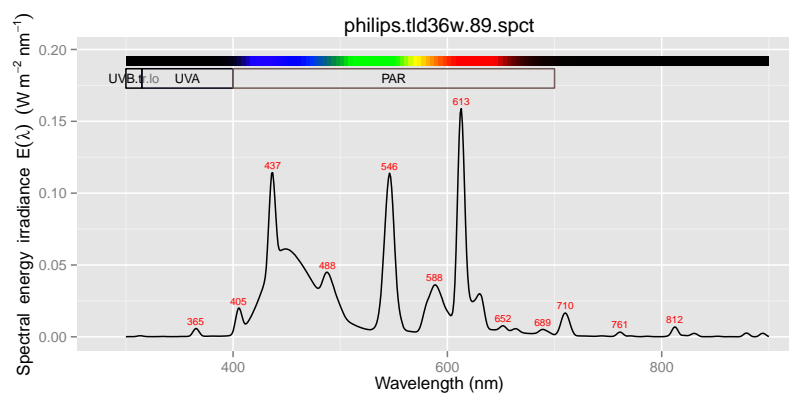
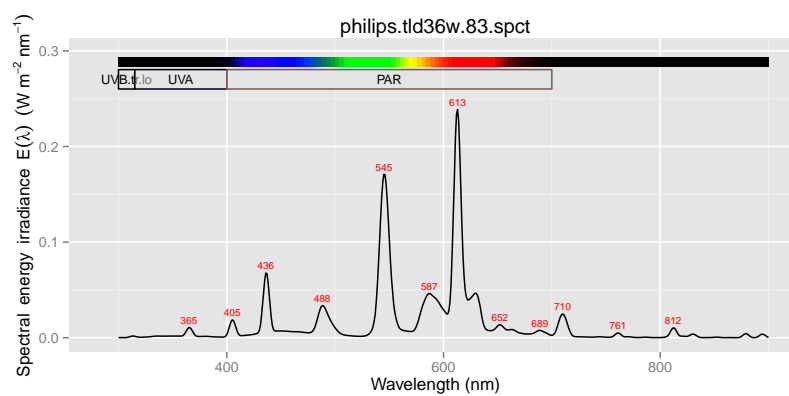
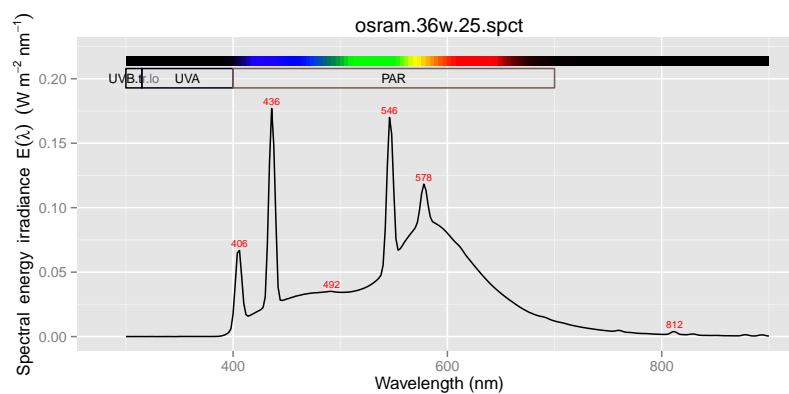


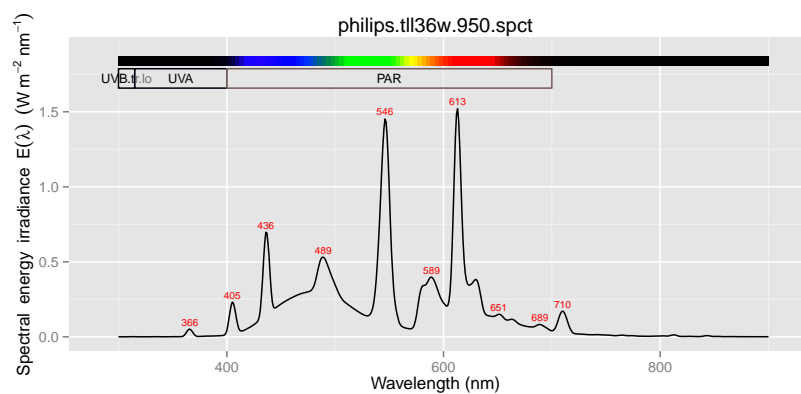
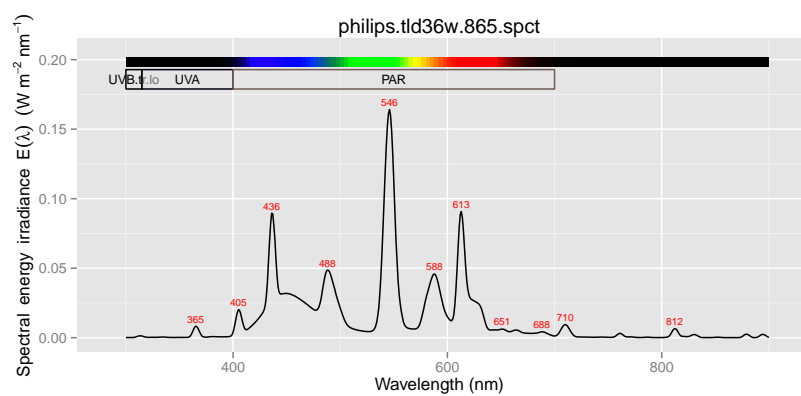
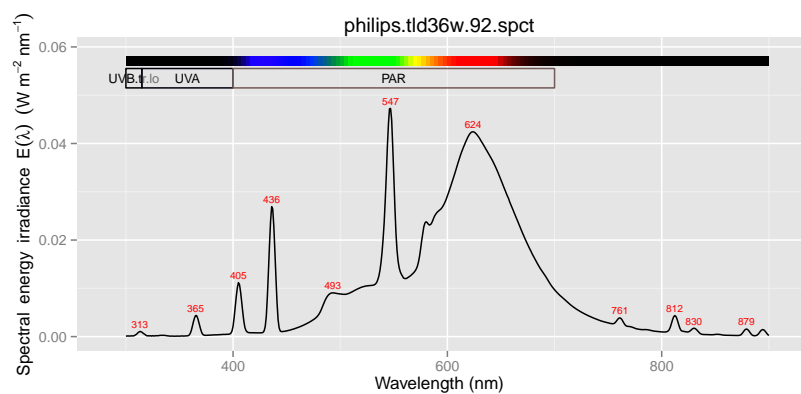


## 5 Broad VIS lamps

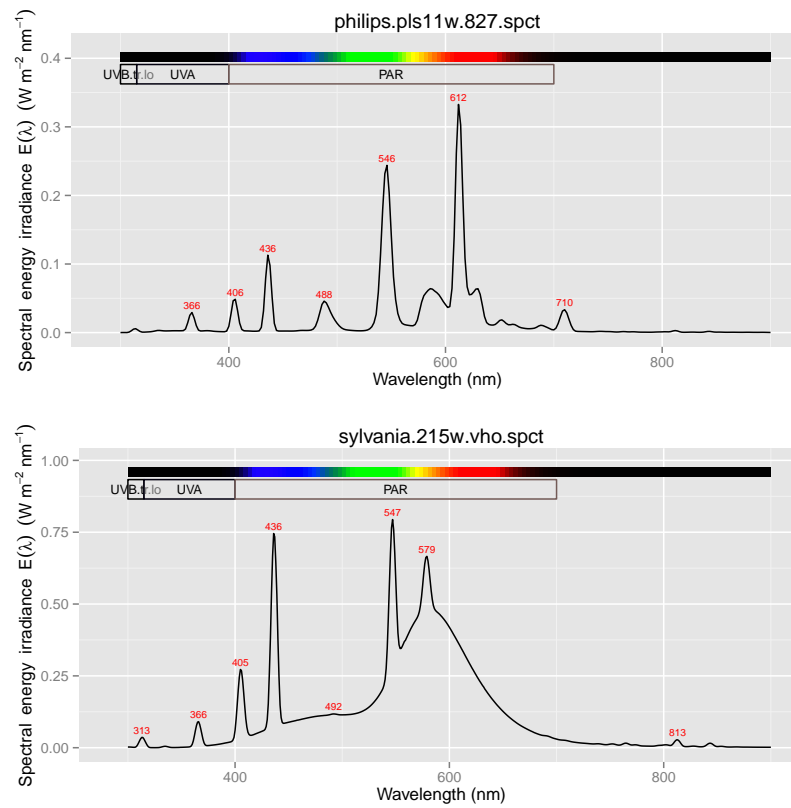
```
plot(incandescent.60w.spct)
plot(osram.36w.25.spct)
plot(philips.tld36w.83.spct)
plot(philips.tld36w.89.spct)
plot(philips.tld36w.92.spct)
plot(philips.tld36w.865.spct)
plot(philips.tld36w.950.spct)
plot(philips.pls11w.827.spct)
plot(sylvania.215w.vho.spct)
```











## 6 Calibration lamps

```
FEL.spct <- FEL_spectrum(300:900)
D2.spct <- D2_spectrum(200:400)
plot(FEL.spct)
plot(D2.spct)
```

