photobiologyLamps Version 0.2.2
Catalogue of Lamps

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1 Introduction

We will plot the emission spectra of the different lamps for which data is provided in the pacakge. 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.

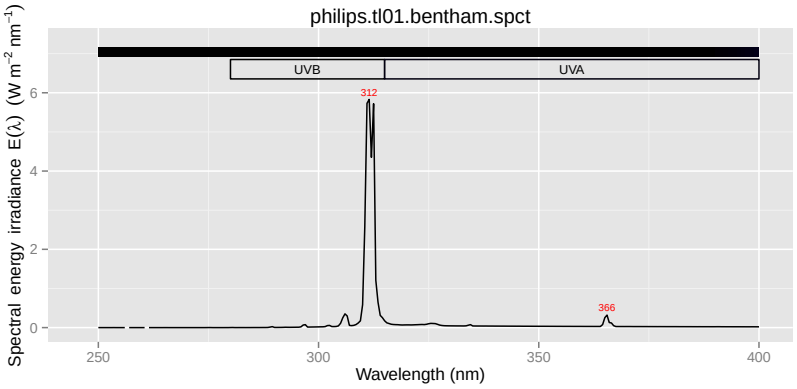
```
library(ggplot2)
library(photobiology)
library(photobiologyLamps)
library(photobiologygg)
```

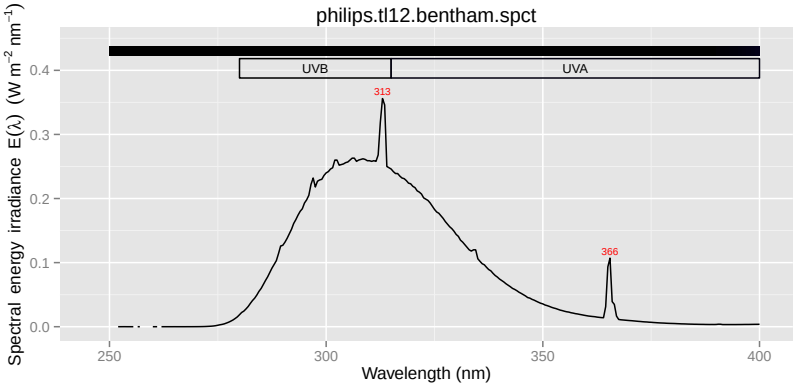
```
options(photobiology.plot.annotations =
          c("boxes", "labels", "colour.guide", "peaks", "title"))
```

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

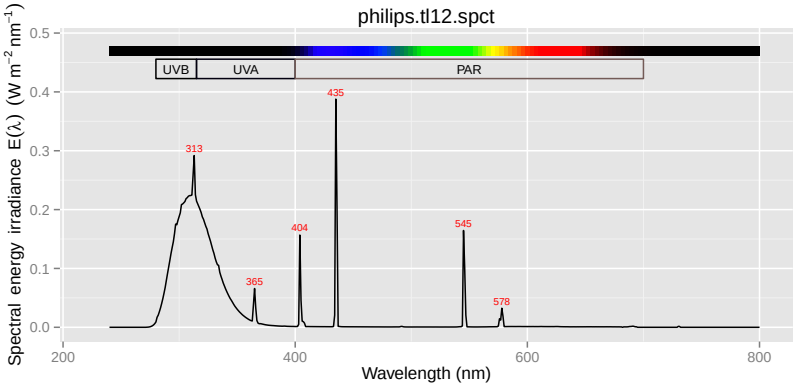
2 UV-B lamp spectra

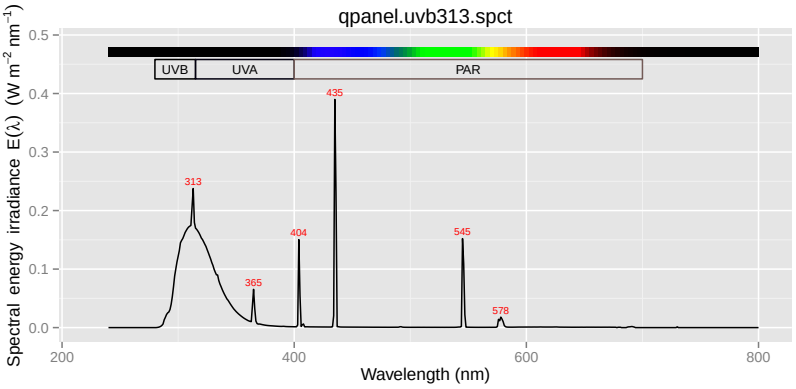
```
plot(philips.tl01.bentham.spct)
plot(philips.tl12.bentham.spct)
```



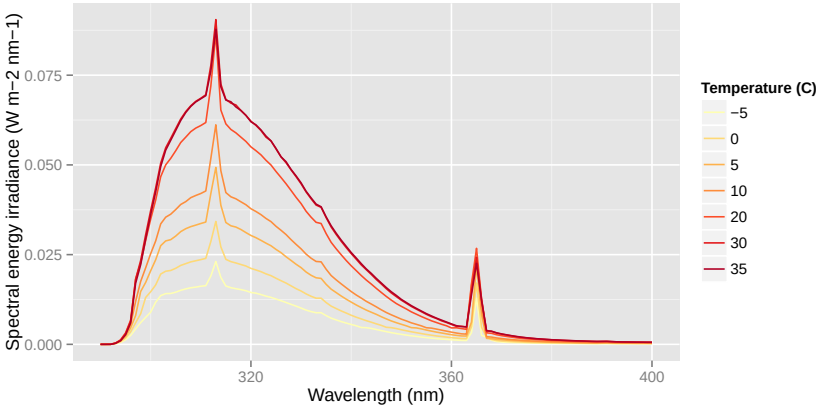



```
plot(philips.tl12.spct)
plot(qpanel.uvb313.spct)
```



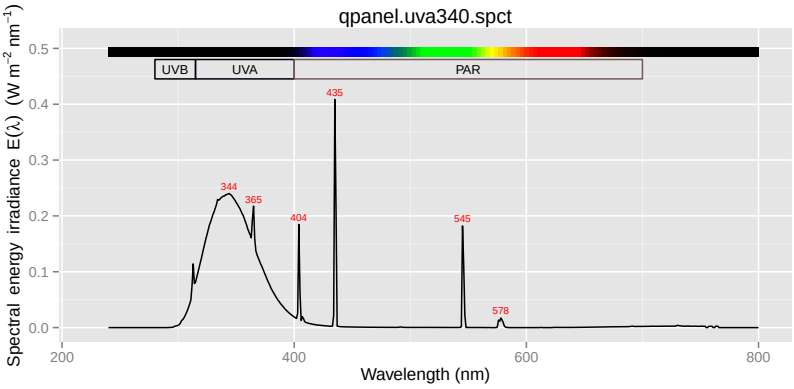



```
fig_temp <- ggplot(data=qpanel.uvb313.temperature.dt,
                   aes(x=w.length, y=s.e.irrad, colour=factor(temperature))) +
              scale_colour_brewer(type="seq", palette="YlOrRd")
fig_temp <- fig_temp + geom_line() +
  labs(x="Wavelength (nm)", y="Spectral energy irradiance (W m-2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



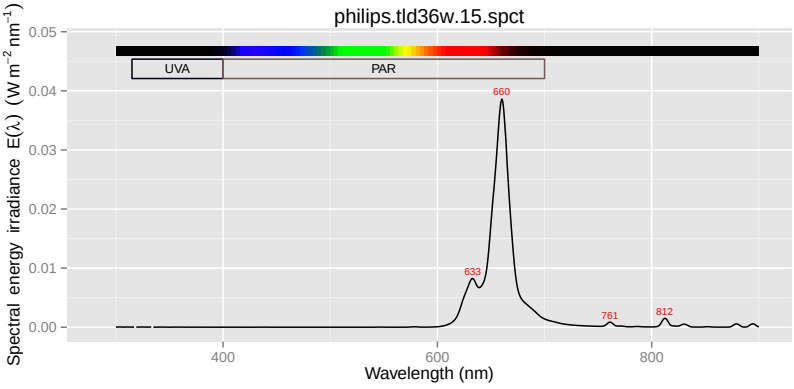
3 UV-A lamp spectra

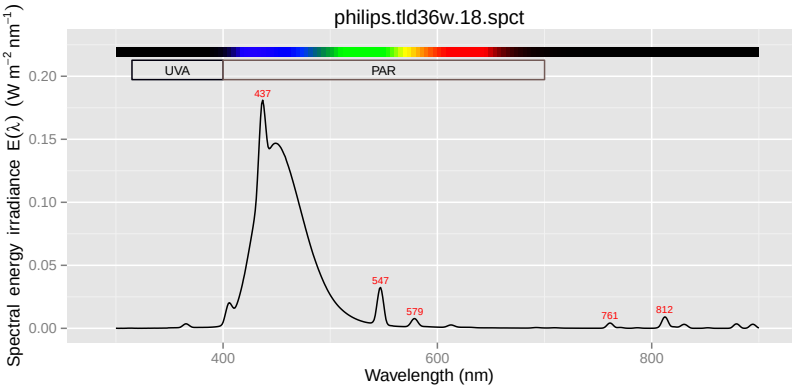
```
plot(qpanel.uva340.spct)
```



4 Narrow spectrum VIS lamps

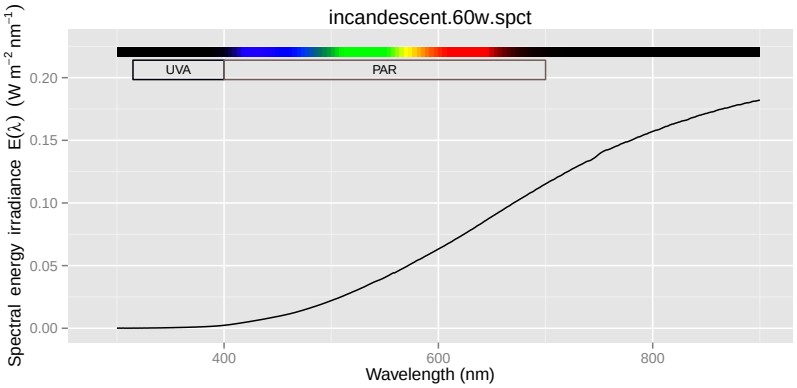
```
plot(philips.tld36w.15.spct)
plot(philips.tld36w.18.spct)
```

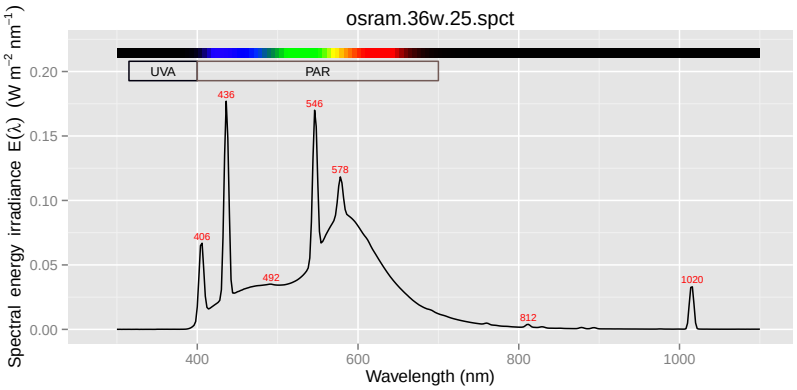


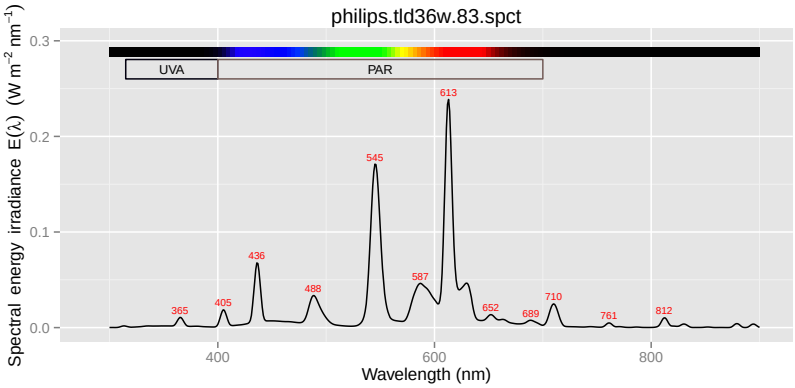


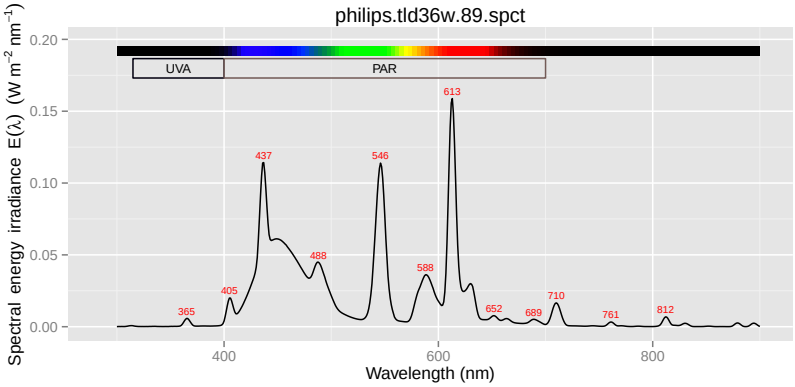
5 Broad VIS lamps

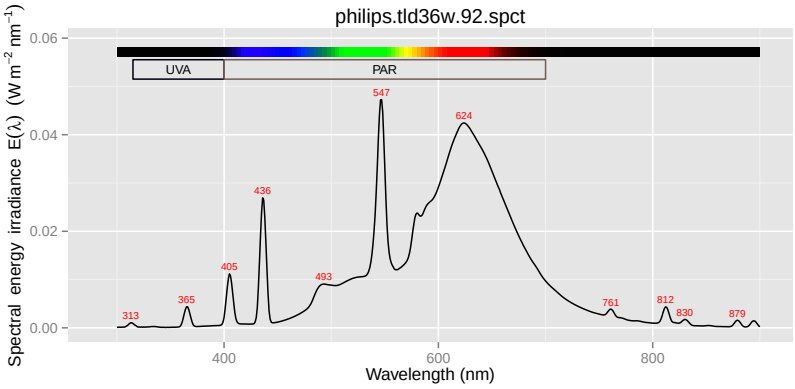
```
plot(incandescent.60w.spct)
plot(osram.36w.25.spct)
plot(philips.tld36w.83.spct)
plot(philips.tld36w.89.spct)
plot(philips.tld36w.92.spct)
plot(philips.tld36w.865.spct)
plot(philips.tll36w.950.spct)
plot(philips.pls11w.827.spct)
plot(sylvania.215w.vho.spct)
```

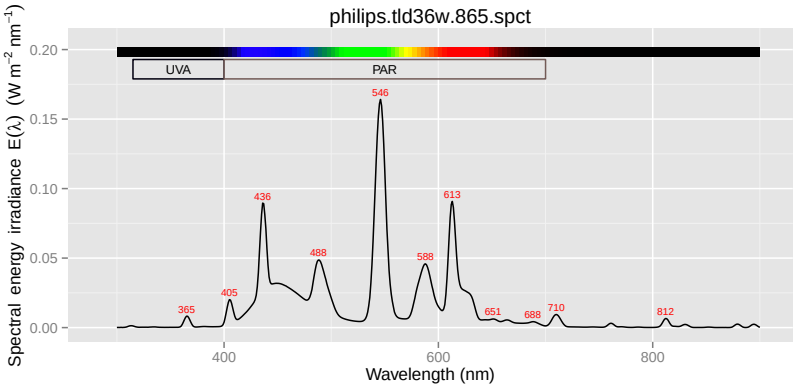


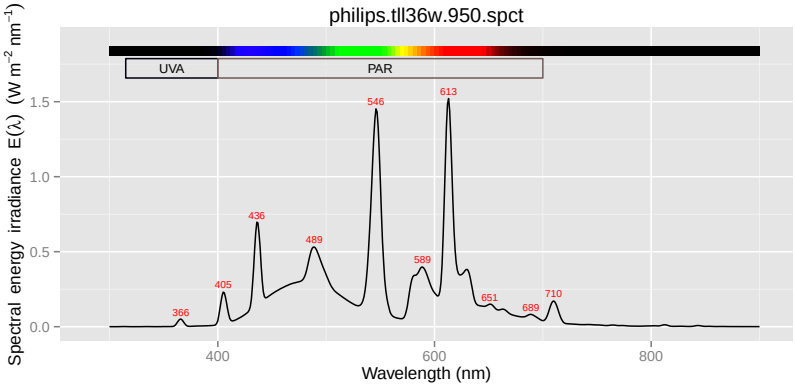


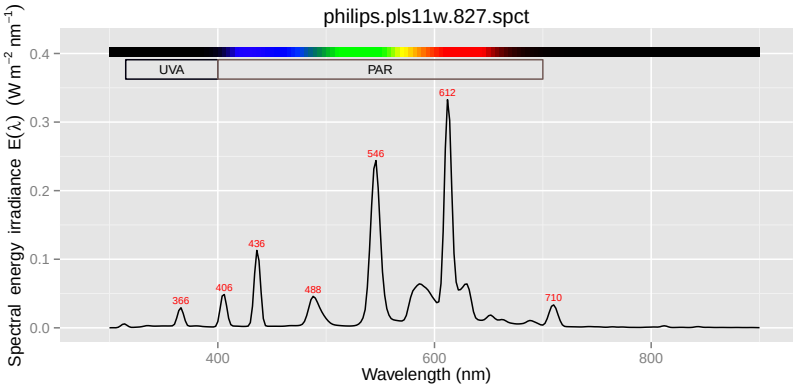

philips.tld36w.83.spct
Spectral energy irradiance E(λ) (W m^{-2} nm^{-1})
UVA
PAR
365
405
436
488
545
587
613
652
689
710
761
812
Wavelength (nm)

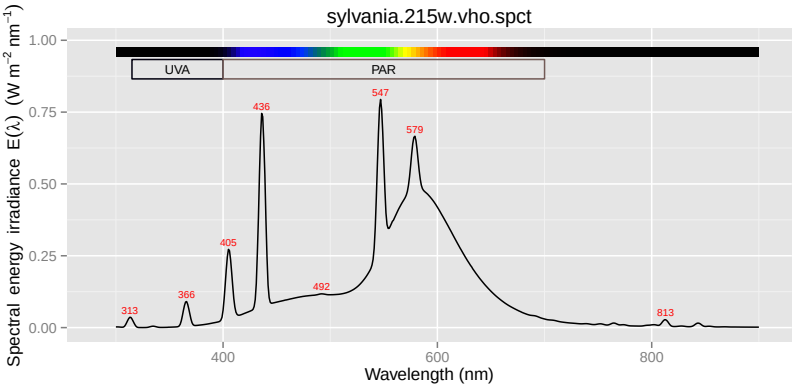

philips.tld36w.89.spct
Spectral energy irradiance E(λ) (W m^{-2} nm^{-1})
UVA
PAR
365
405
437
488
546
588
613
652
689
710
761
812
Wavelength (nm)


philips.tld36w.92.spct
Spectral energy irradiance E(λ) (W m^{-2} nm^{-1})
UVA
PAR
313
365
405
436
493
547
624
761
812
830
879
Wavelength (nm)


philips.tld36w.865.spct
Spectral energy irradiance E(λ) (W m⁻² nm⁻¹)
UVA
PAR
546
436
613
488
588
405
365
651
688
710
812
0.20
0.15
0.10
0.05
0.00
400
600
800
Wavelength (nm)

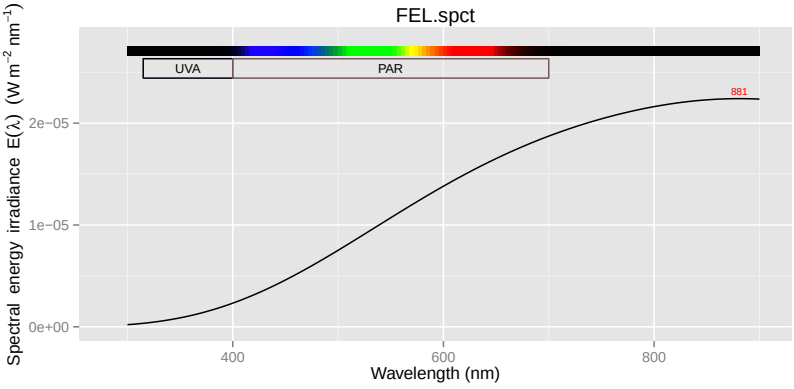

philips.tll36w.950.spct
Spectral energy irradiance E(λ) (W m⁻² nm⁻¹)
UVA
PAR
546
613
436
489
589
405
366
651
689
710
1.5
1.0
0.5
0.0
400
600
800
Wavelength (nm)

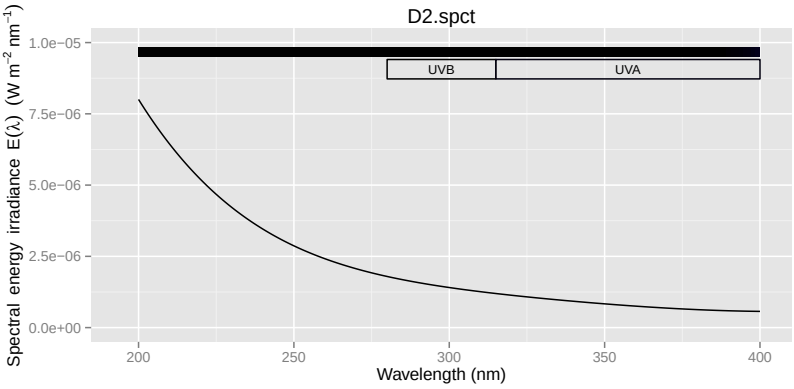

philips.pls11w.827.spct
Spectral energy irradiance E(λ) (W m⁻² nm⁻¹)
UVA
PAR
612
546
436
366
406
488
710
0.4
0.3
0.2
0.1
0.0
400
600
800
Wavelength (nm)



6 Calibration lamps

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




D2.spct
UVB
UVA
1.0e−05
7.5e−06
5.0e−06
2.5e−06
0.0e+00
200
250
300
350
400
Wavelength (nm)
Spectral energy irradiance E(λ) (W m−2 nm−1)