DOING PHYSICS WITH MATLAB

VISIBLE SPECTRUM

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DOWNLOAD DIRECTORY FOR MATLAB SCRIPTS

Download and inspect the scripts and make sure you can follow the structure of the programs.

wm_spectrum.m

Color plot of the visible spectrum for the wavelength range from 380 nm to 780 nm.

Calls the function **ColorCode.m**

Colorcode.m

Function to give the RGB values for a given wavelength color.

Is it assumed the supplied lambda is within the range 380-780 nm.

Smaller or higher values are set notionally to the extreme values.

The script **wm_spectrum.m** can be used to produce a plot of the visible spectrum for the wavelength range from 380 nm to 780 nm. The script uses the **area** plot function to give the spectrum. The color for each wavelength is calculated from the function **ColorCode.m**.

```
clear
close all
clc

figure(1)
    pos = [0.1 0.1 0.3 0.2];
    set(gcf,'Units','normalized');
    set(gcf,'Position',pos);
    set(gcf,'color','w');
    N = 512;
    xP = linspace(380,780,N);
    yP = ones(1,length(xP));

    hold on

    thisColorMap = hsv(512);

for cx = 1:N-1
    wL = xP(cx)*1e-9;
    thisColor = ColorCode(wL);
    h_area = area(xP(cx:cx+1),yP(cx:cx+1));
    set(h_area,'FaceColor',thisColor);
    set(h_area,'EdgeColor',thisColor);
    set(gca,'xLim',[380 770]);
end

    xlabel('wavelength  \lambda   [ nm ] ','fontsize',14);
    set(gca,'fontsize',14);
    set(gca,'yTick',[]);
```

The plot of for the visible spectrum is shown below.