

Instructions

Please save your code for the following exercises to an m-file and send it to me by email (mwei@ucsd.edu). To help you get started, lab3start.m has a few lines of code.

1) Plot the spectral radiance of a blackbody as a function of wavelength for object at 300 K (earth), 1000 K, and 6000 K (sun)? Calculate the wavelength of peak radiation for each temperature, and plot it on the same figure (use hold on). (The finished plot should look like figure 2.10 from Rees).

2) Download a La Jolla topography file from ftp://topex.ucsd.edu/pub/class/rs/LAB3/lajolla_swab if you're using a PC). Read the topography into an array and make an image. Can you make an illuminated image by using the `diff()` command? You will need to set the limits in `imagesc` to `[-1000,1000]` because there are some extreme slopes at the coastline.

3) Read in a jpeg photo (file of passive-source EM radiation at three visible bands) using `imread()`. (Use your own photo or the default file on the ftp site. An image with bright colors works best.) Look the red, blue, and green components separately. Recombine the three bands into an RGB image. Do you get what you started with? Recombine the three bands in a different order, e.g. GBR, and look at the image. Does it make sense to you? Are the originally red colors now green? Try another RGB combination. Write one of these recombined files to a jpeg file using `imwrite`, and send it along with your code.