

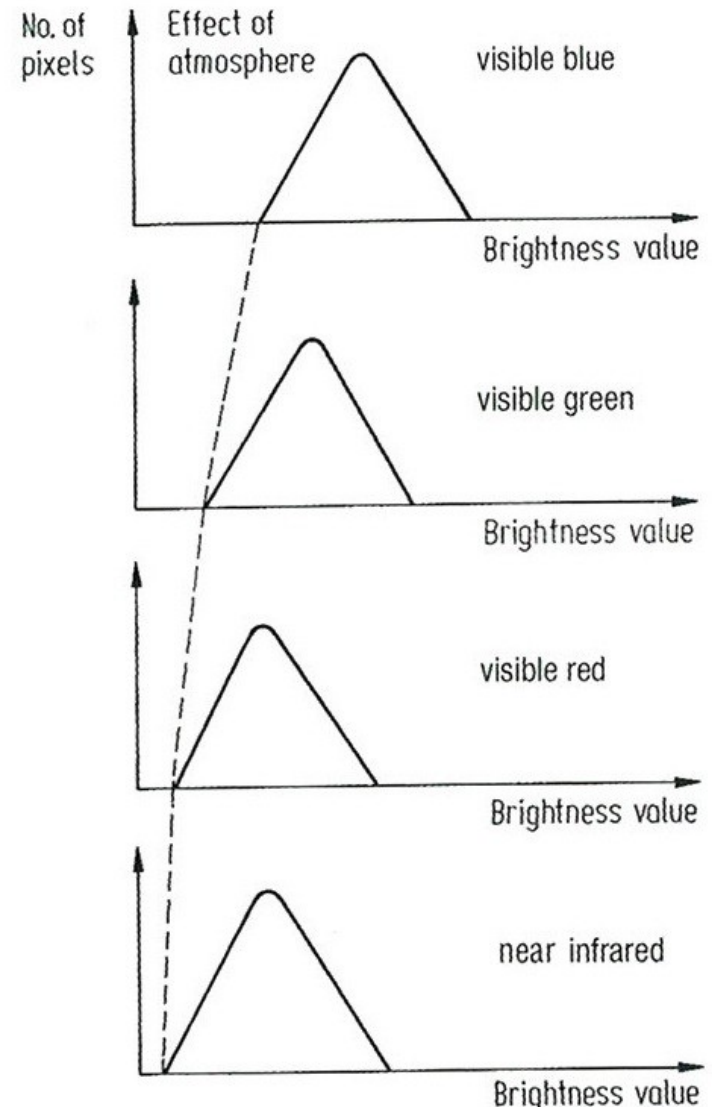
Agenda

- Image of the Day
- Lab 1 Due
- Quick Review
- Transfer Functions
- Lab 2 Notes



Bulk Atmospheric Correction

- Often it is sufficient to assume there are pixel values close to zero in the imagery (e.g. water)
- In this case, any brightness observed will be a result of atmospheric contributions (Primarily L_p but also E_D)
- Histograms of each channel will show an offset from zero as a result
 - Wavelength dependent
- Subtracting this offset from the entire image will remove the vast majority of atmospheric effects



Effects of the Atmosphere

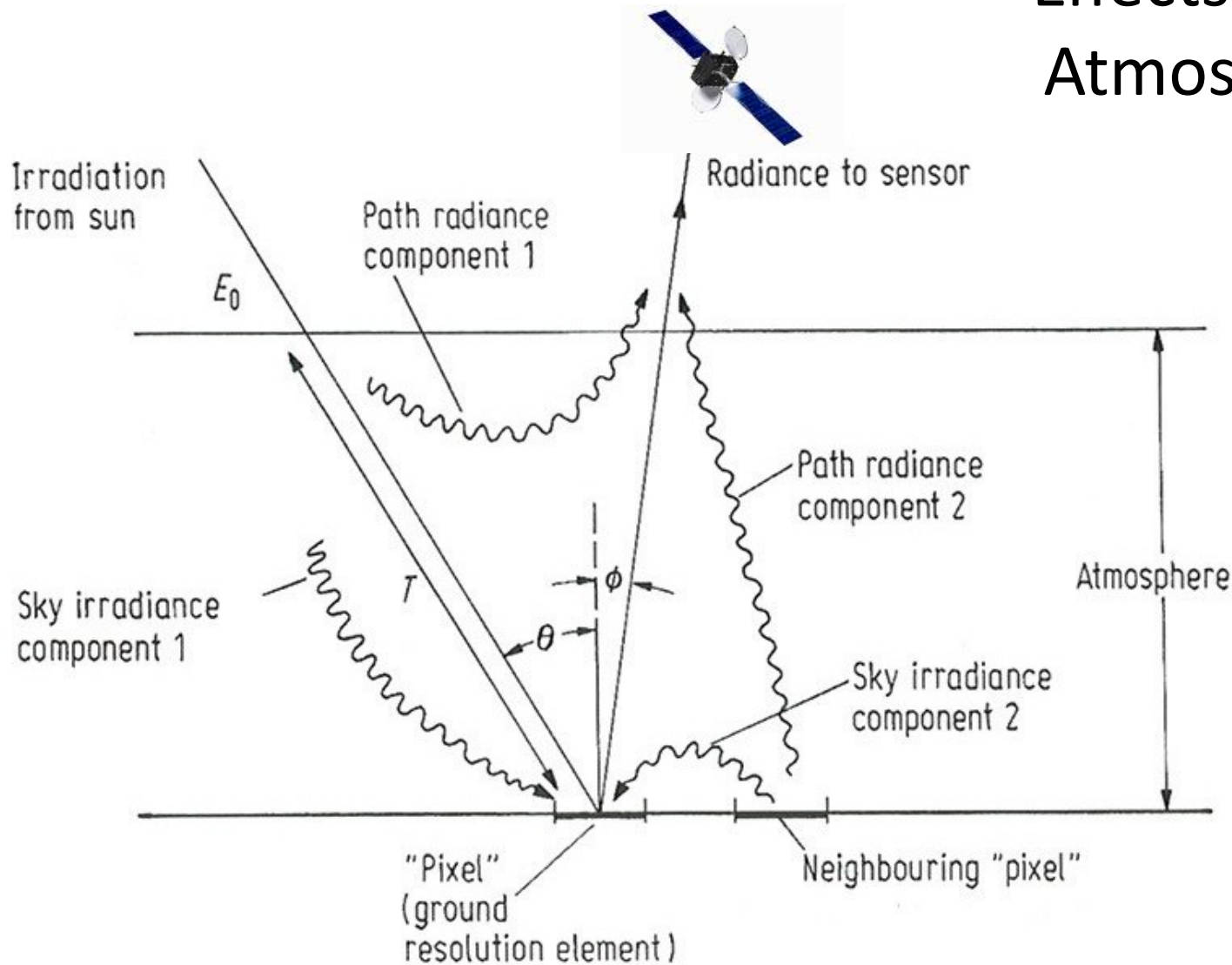
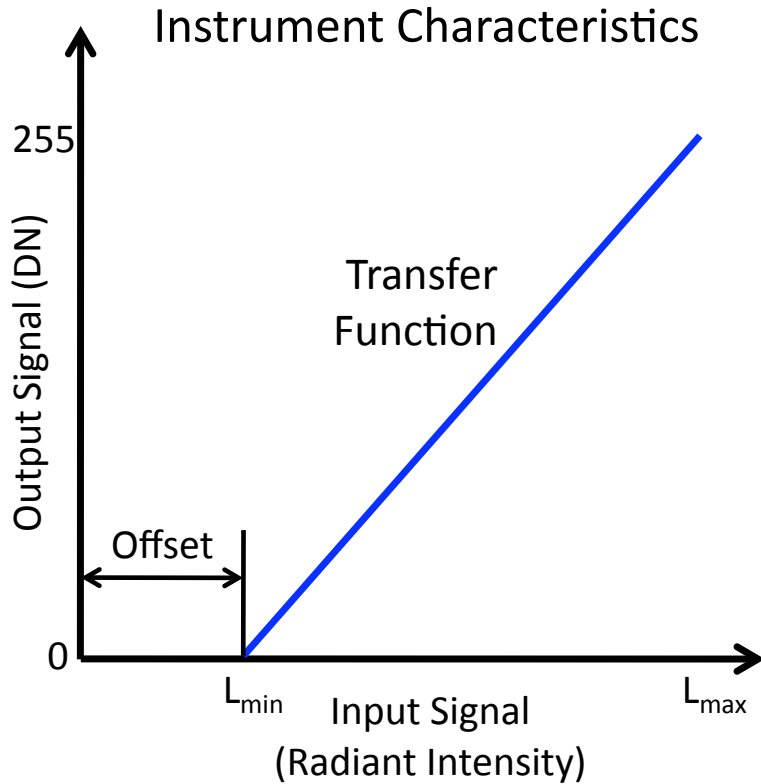
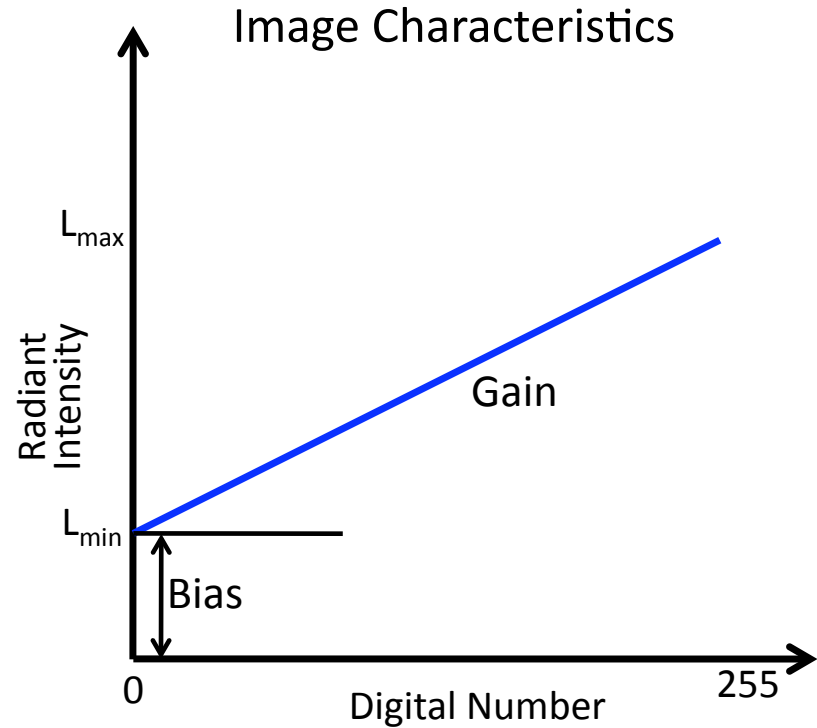


Fig. 2.1. The effect of the atmosphere in determining various paths for energy to illuminate a (equivalent ground) pixel and to reach the sensor

Apparent Surface Temperature



Radiometric Resolution/
Dynamic Range



$$L = \text{Bias} + (\text{Gain} \times \text{DN})$$

Lab 2 Notes: Part 1

- Transfer Functions:
 - Bias = Lmin = Offset
- Edit default values when using the calibration tool
 - Defaults for Landsat 7 have a high and a low setting
 - Button choice doesn't matter; make sure values are correct
- Solar Zenith:
 - Is '0' when the sun is directly overhead
 - Can be calculated from solar elevation:
 - Zenith = $(90 - \text{solar elevation})$ [assumes degrees]
 - Excel expects inputs to $\cos()$ in radians
 - Use function $\text{radians}()$ to convert

Lab 2 Notes: Part 1

- Check your reflectance values
 - Values are a percentage
 - Expected values are between 0 and 1
- Calculating Reflectance assumes DN_s in ENVI
- There should be one manual calculation sheet per person.
- The group can share a comparative sheet for question 3

Addressing Corrections Quickly

- Excel Changes
 - Change the fewest cells possible; changes will propagate.
 - For Example:
 - If your cosine function was using degrees rather than radians, change your zenith cell
 - Much faster than adding radians() to 18 cells
- Looking up pixel changes
 - Open all 6 bands in separate windows
 - Link all open windows
 - Call pixel locator; make sure that your mouse isn't near or on any of the images after you hit apply

Part 2 (MOD0) Examples

- SSH / Terminal / Shell use
- Filezilla