



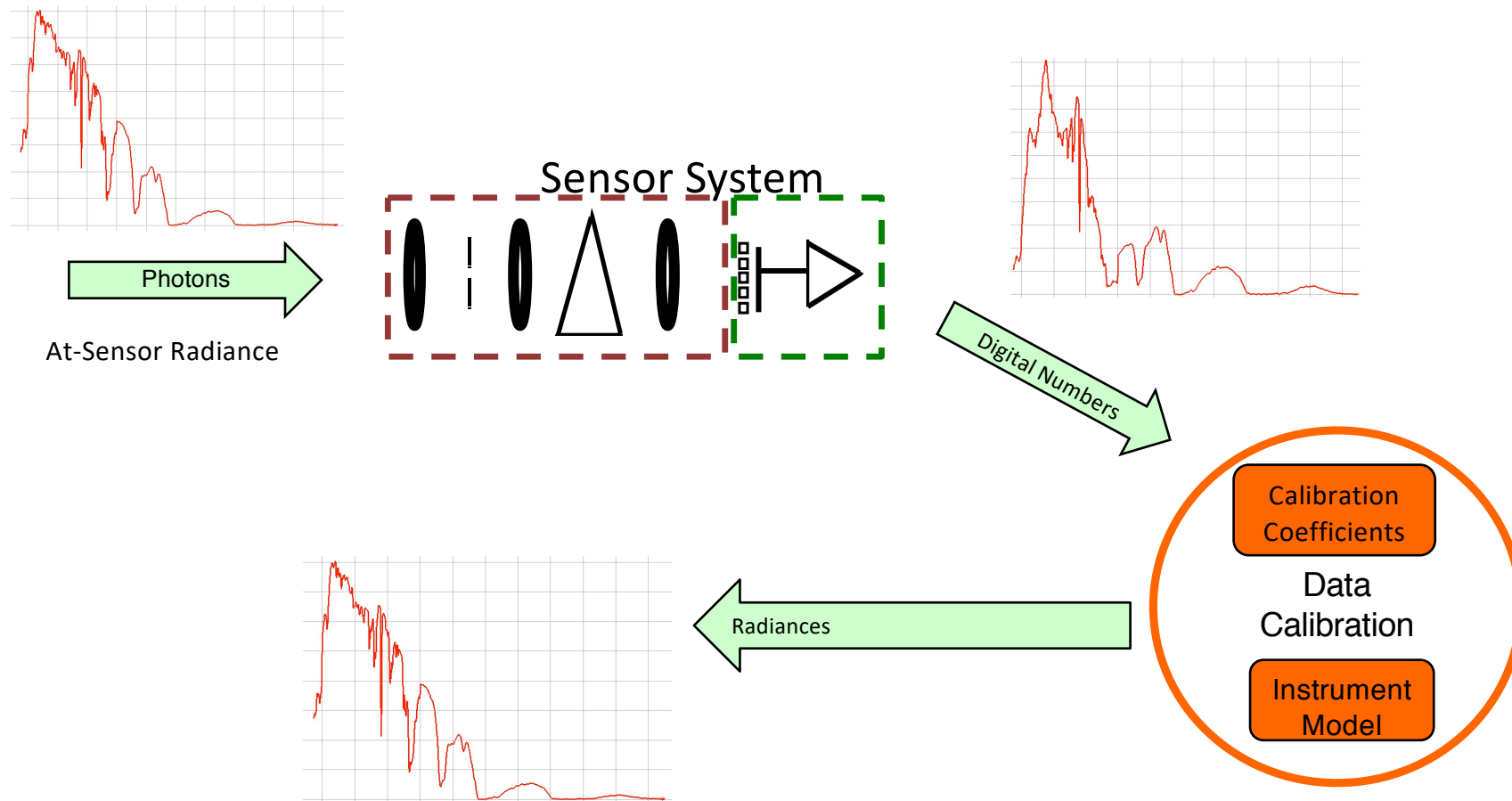
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Radiometric Responsivity or Calibration Coefficient Determination and Data Calibration

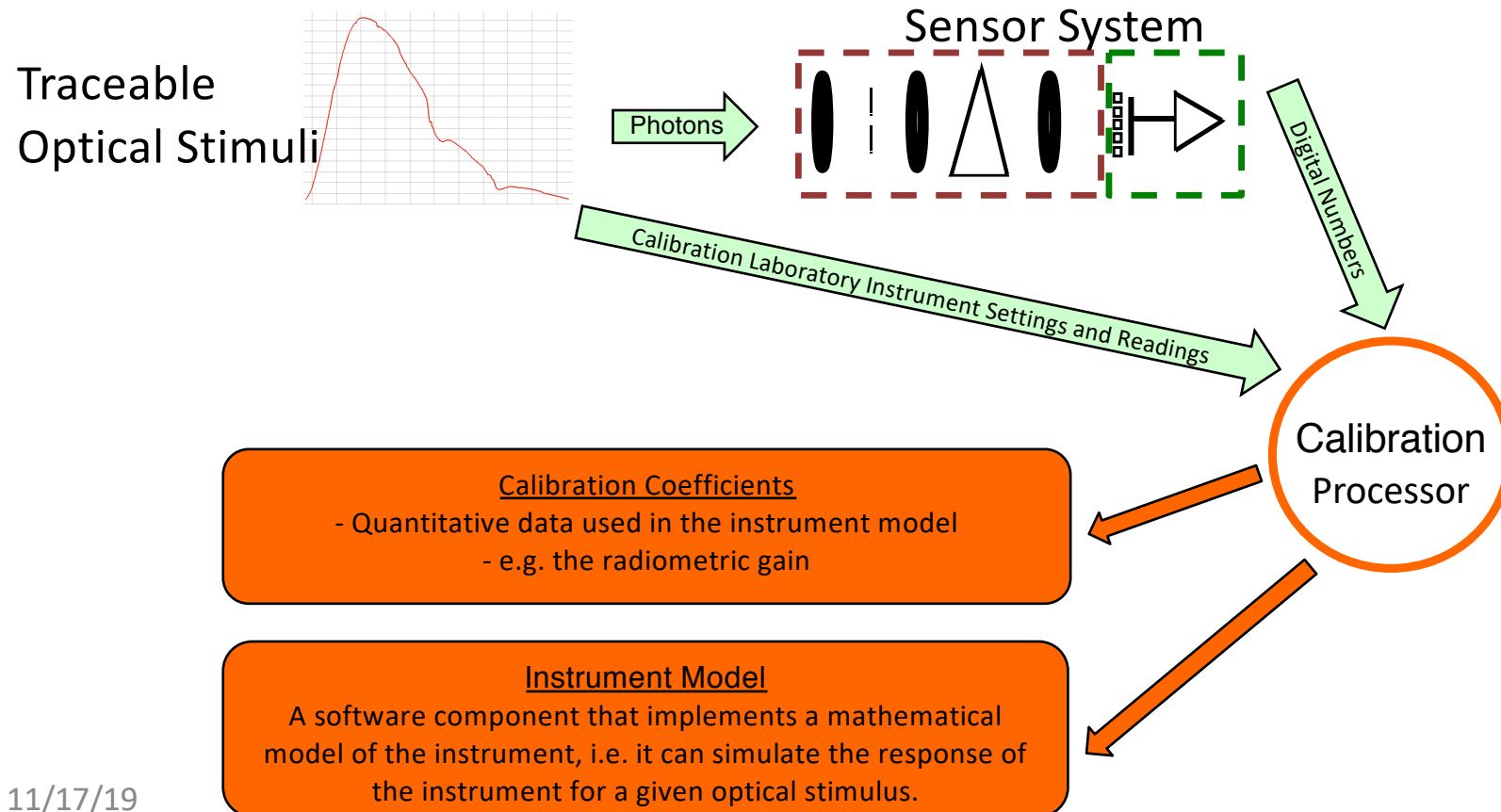
2019

WG4





Calibration and Characterisation



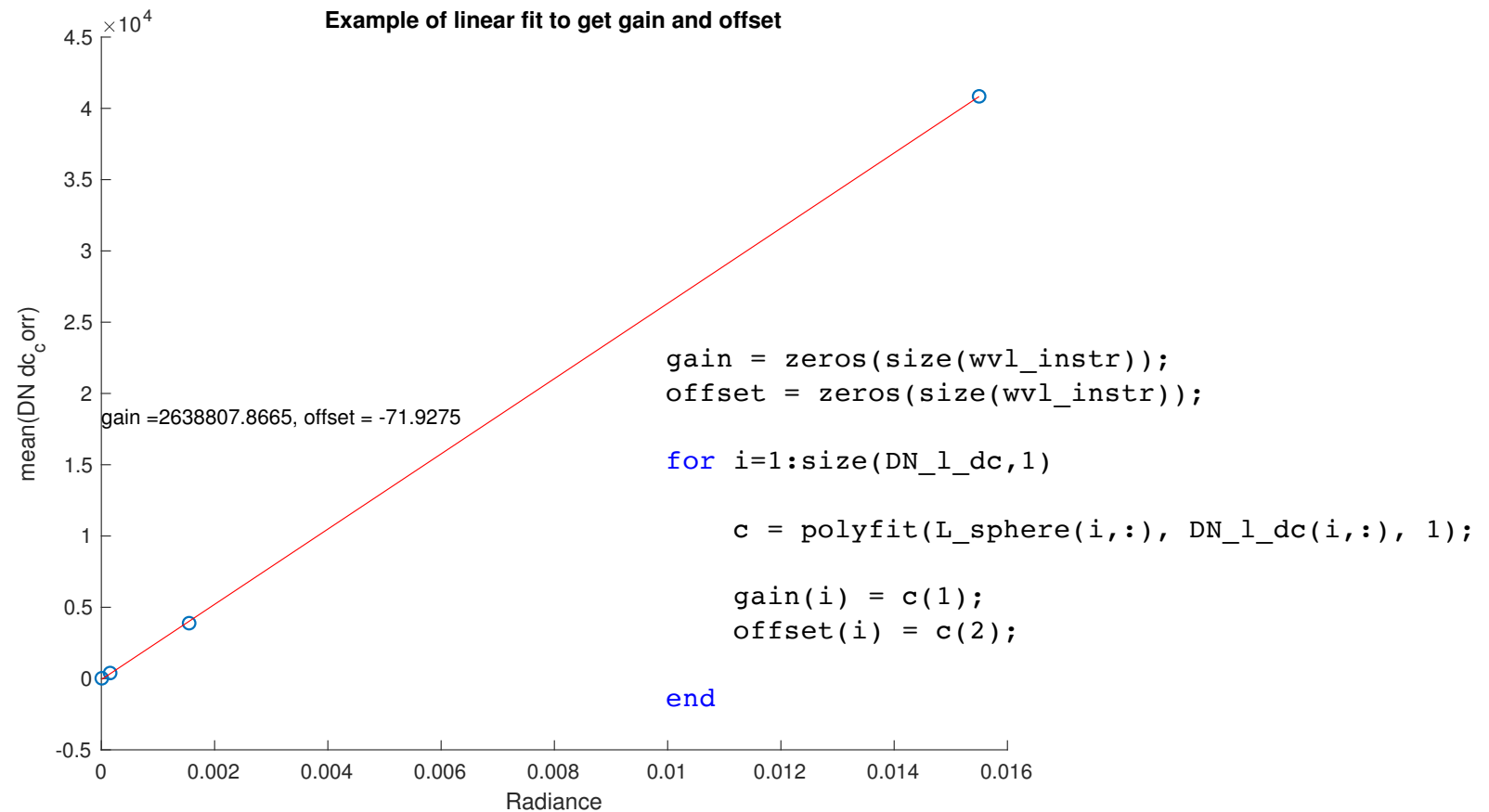


Straight Line Calibration per Band

This is the
instrument
responsivity.

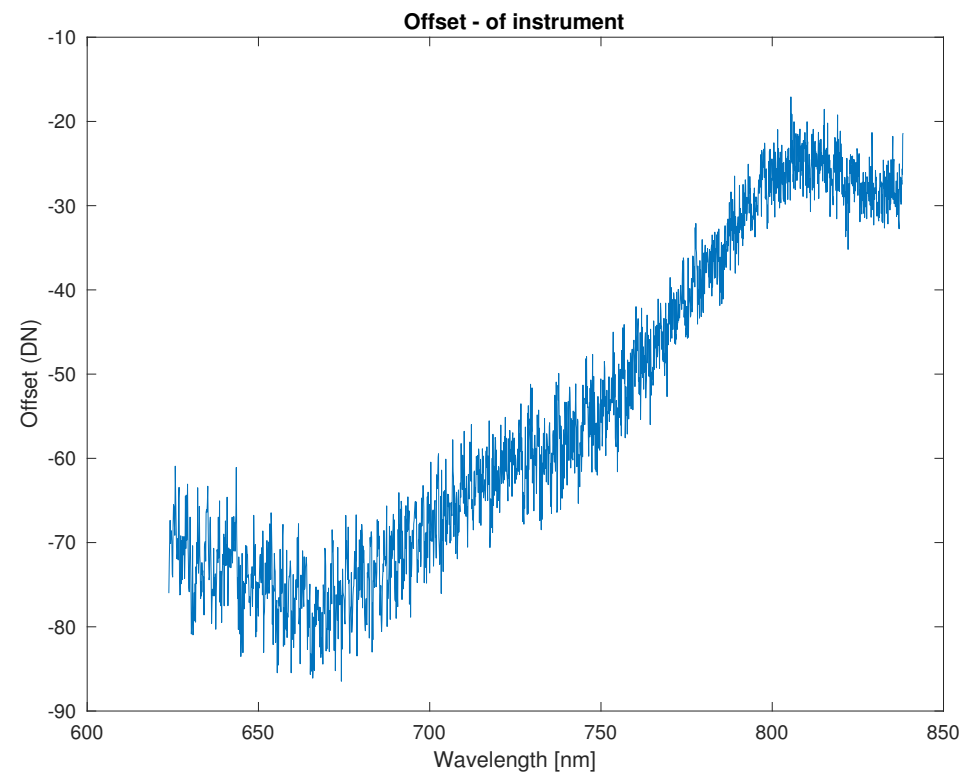
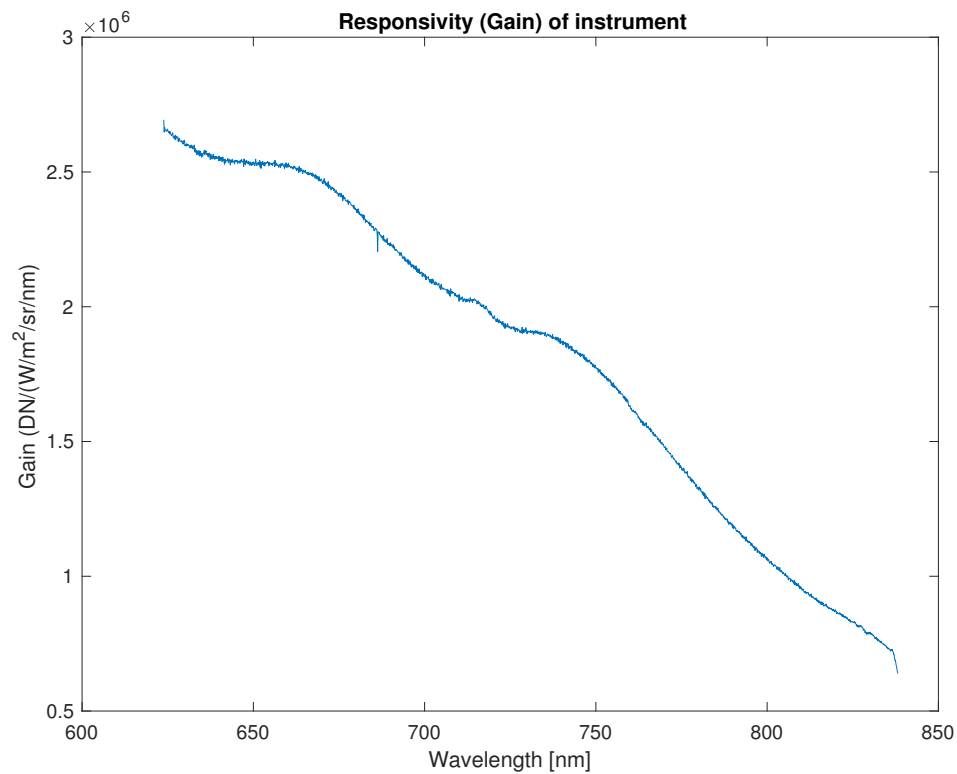
$$\text{DN} = \text{gain} \times L + o$$

$$L = (\text{DN} - o) / \text{gain}$$





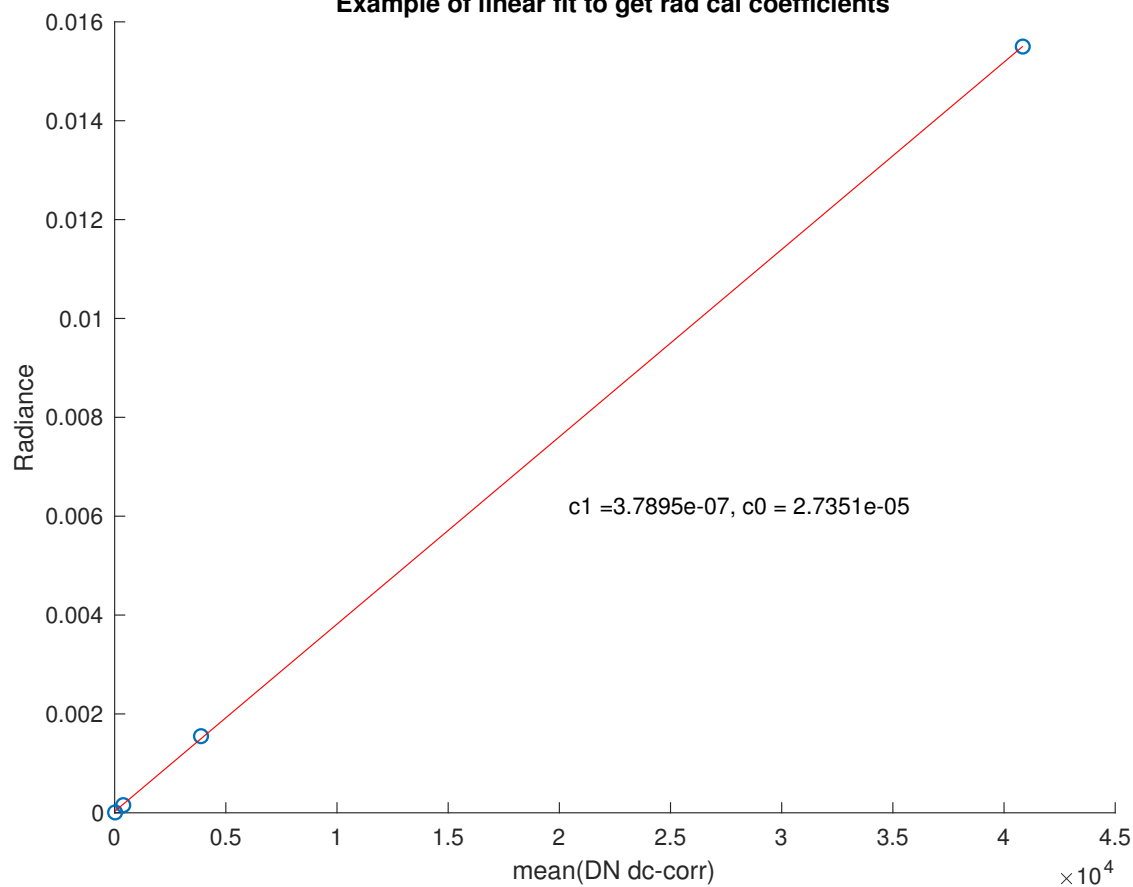
Instrument Responsivity: Gain and Offset





Determination of Calibration Coefficients

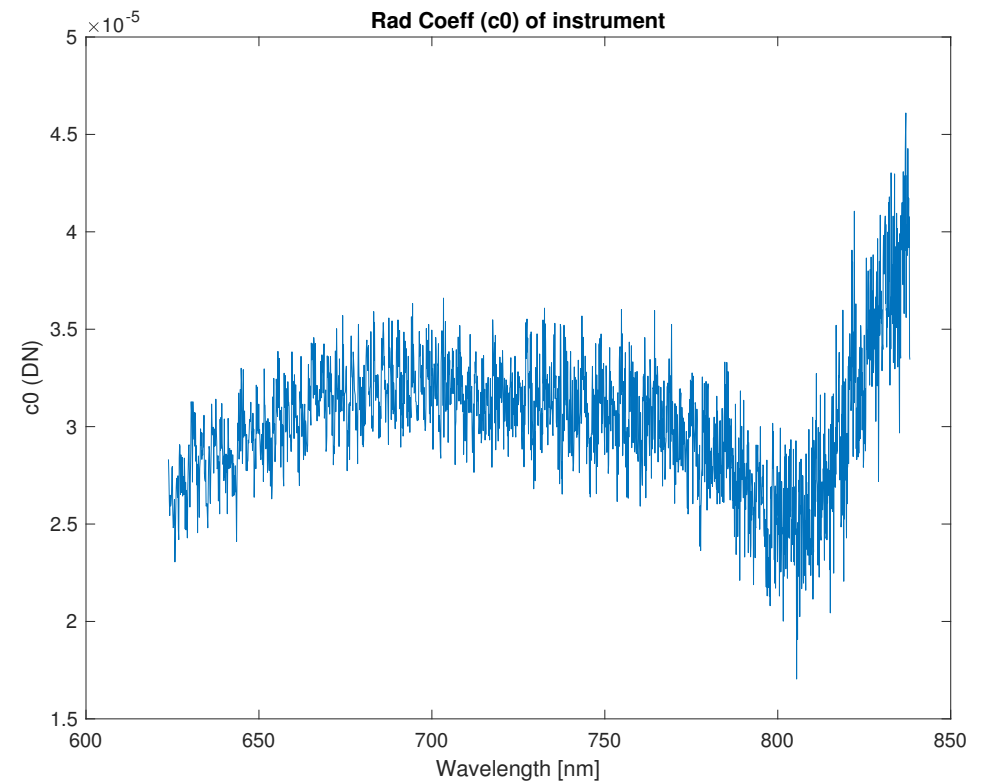
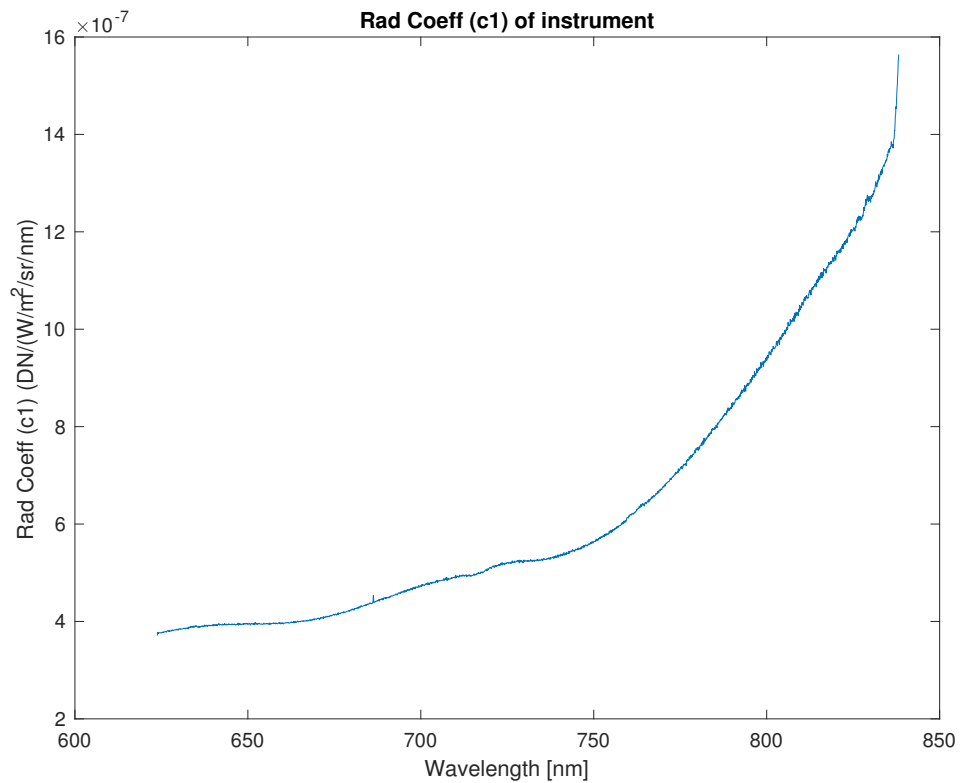
Example of linear fit to get rad cal coefficients



$$L = DN \times c1 + c0$$



Determination of Calibration Coefficients





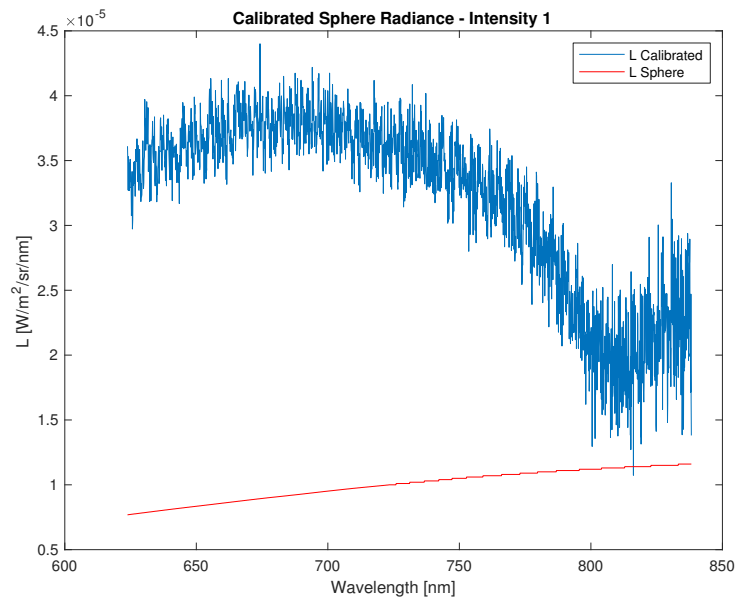
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Data Calibration

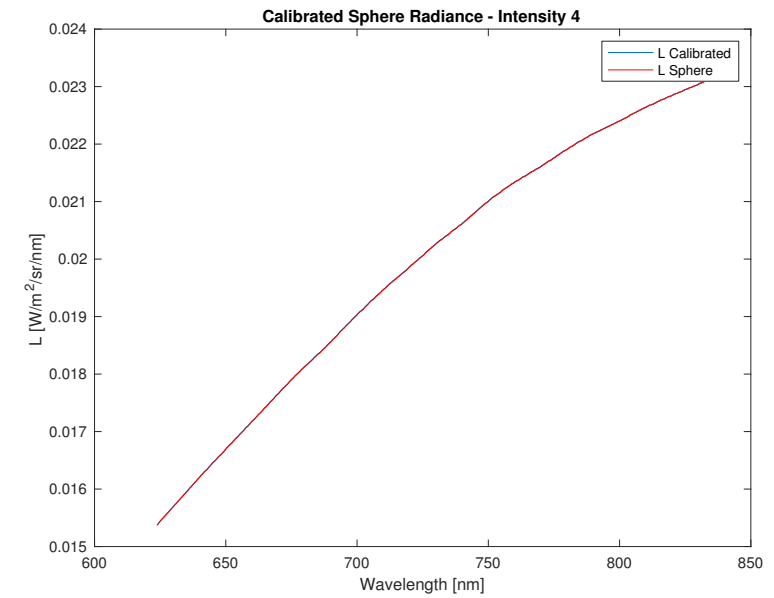
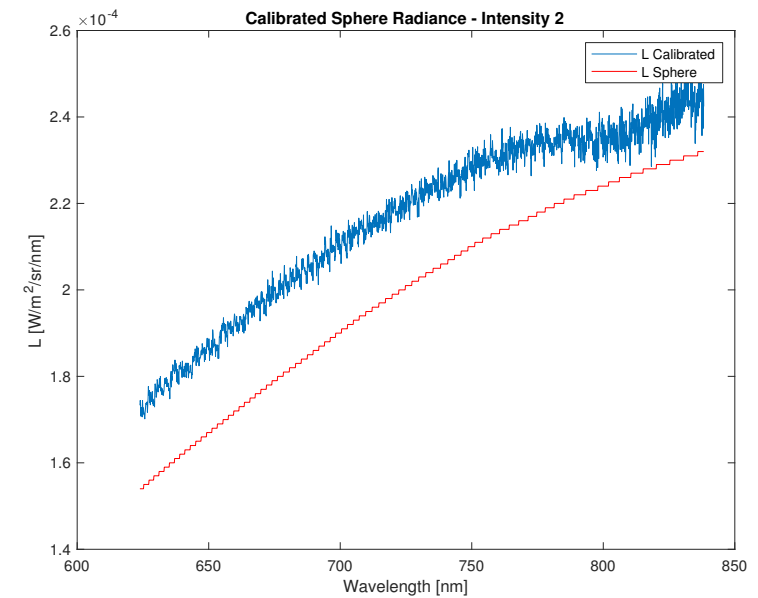
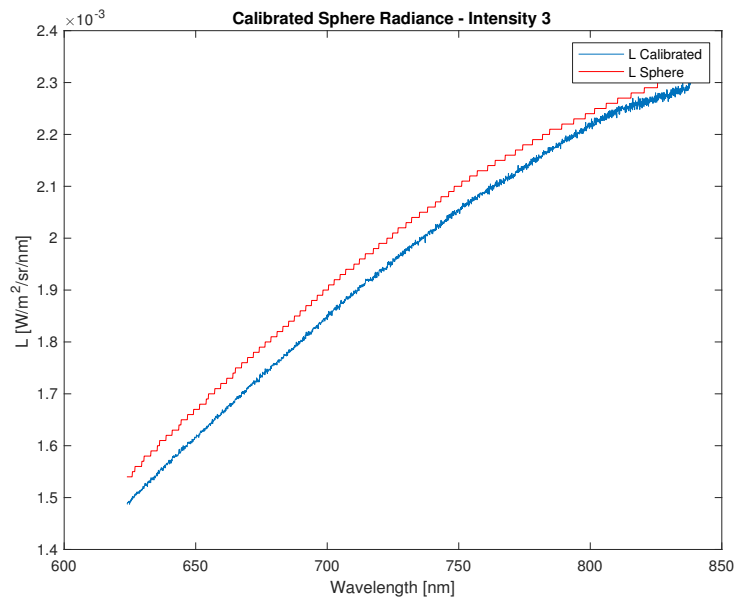
- This is the inversion of the instrument model: get L from measured DN

$$L = (DN - o) / \text{gain}$$



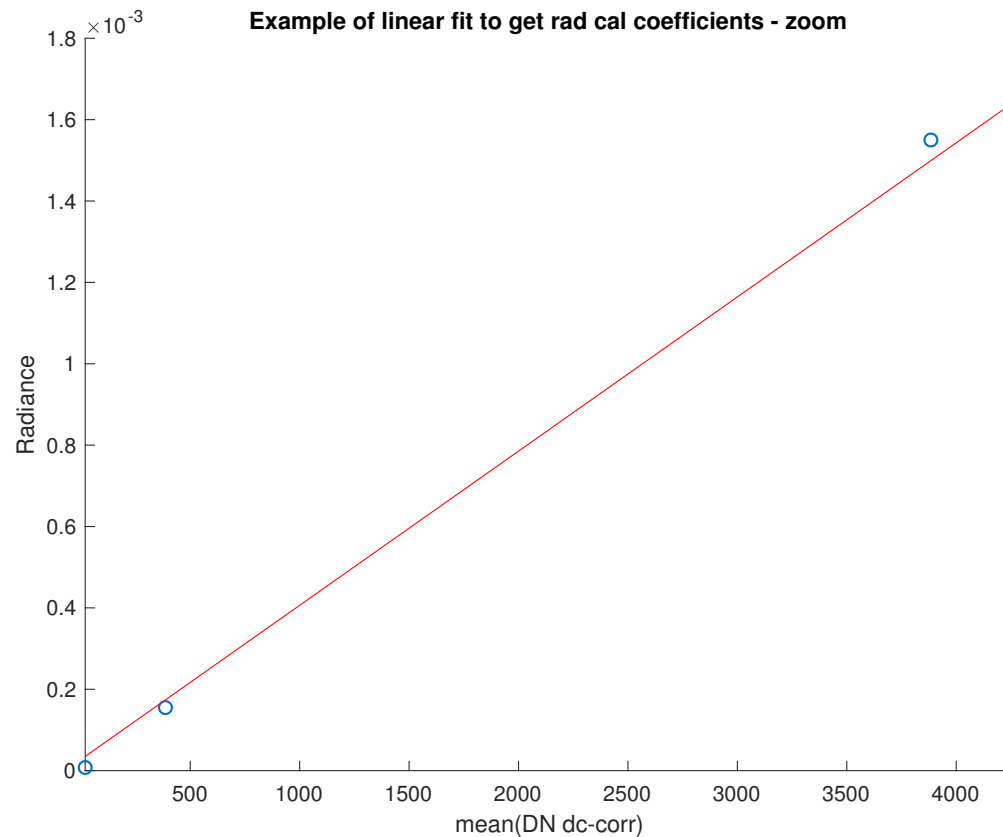
Data Calibration

Data calibration applied to all DN levels and comparison to sphere radiance





Is there something wrong with our calibration?



Errors for very low light levels:
instrument is likely non-linear for low
lights.

Possible solutions:

- Calibrate instrument in linear range
- Create a more complex model, e.g. 2nd order polynomial