**Research Internship/Bachelor's thesis**

Modeling two photodiode sensors

Near solar power plants, there are often measurement devices installed that measure solar irradiance. Some of those are based on thermopile elements, others on photodiodes. Your task will be to model the photodiode irradiance sensor with its inputs and outputs in Matlab or Python.

You shall also adjust the model for another sensor, which is a cheap commercial sensor for measuring illuminance. Your model will then be able to show how much the cheap light sensor's power output will differ from the irradiance sensors power output. Subsequently, the differences in linearity should be evaluated.

Figure 1: Solar spectrum [1] and responsivity of a photodiode [2]
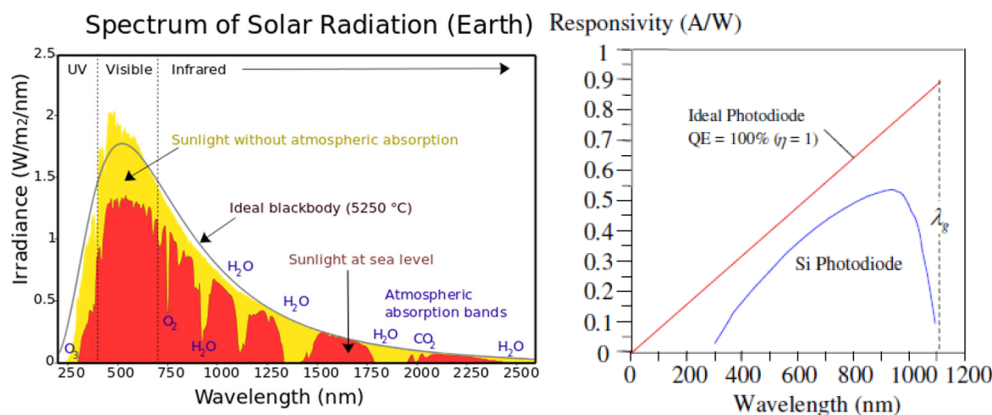
Finally, you will confirm your simulation results by performing measurements with a real cheap light sensor and a real irradiance sensor. Your research will provide insights on how cheap photodiodes can be used for irradiance sensing.

You should be proficient with either Matlab or Python and be familiar with photodiodes.

References:

[1] Nick84 [CC BY-SA 3.0(link is external)], via Wikimedia Commons, retrieved on https://www.e-education.psu.edu/me-teo300/node/683

[2] The Semiconductor Multiplication System for Photoelectrons in a Vacuum Silicon Photomultiplier Tube and Related Front End Electronics - Scientific Figure on ResearchGate. Available from: https://www.researchgate.net/figure/Comparison-be-tween-the-spectral-response-of-a-realistic-photodiode-and-an-ideal_fig27_316647242 [accessed 13 Jun, 2023]

Required knowledge:

- Matlab programming and simulation skills, alternatively python
- Knowledge in photodiodes

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