Session #1 Assignment

Fundamentals of Photovoltaic Engineering

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1. Retrieve daily measurements from three nearby meteorological stations (time series length 10 years).
2. *(Session #2) Filter each time series using physical limits*.
3. Compute a daily time series representative of the region with the average of the three time series. Compare this time series with each station using statistical metrics (MBD, RMSD, MAD).
4. Choose a location inside the perimeter defined by the three stations, and estimate the daily solar radiation using spatial interpolation (IDW).
5. Retrieve monthly averages of solar radiation from a satellite service (preferably CMSAF, with QGis or similar software) for a region covering the three stations.
6. Compare the satellite values at the three locations with the monthly averages of the measurements provided by the stations, using statistical metrics.
7. Combine the satellite estimations at the location defined in step 4 with the monthly averages of the result of that step. Thus, if we denote the monthly averages of daily values of step #4 with $G_{dm,IDW}$ and the satellite estimates with $G_{dm,sat}$, the result of step #7 is (for each month):

$$G_{dm} = 1/2 \cdot (G_{dm,IDW} + G_{dm,sat})$$

The result of the last step will be used in Session #2.