

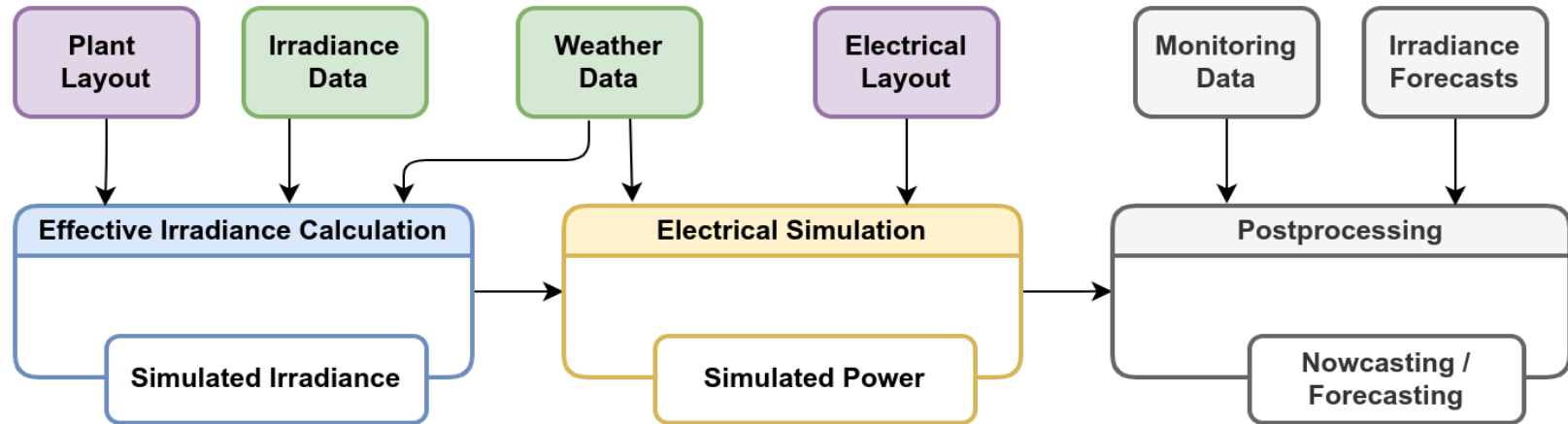
Context

- (2012) Branch of Matlab-PVLIB
 - ~ Irregular Terrain & Trackers (CPV)
 - ~ Mismatch (string-layout)
 - ~ Sub-hourly time-steps
- (2016) Start-Up
 - ~ Digital Twins
 - ~ Parametric studies (shading)
- (2019) HyForPV
 - ~ Performance Optimization
 - ~ Consolidation & Validation
 - ~ Data assimilation

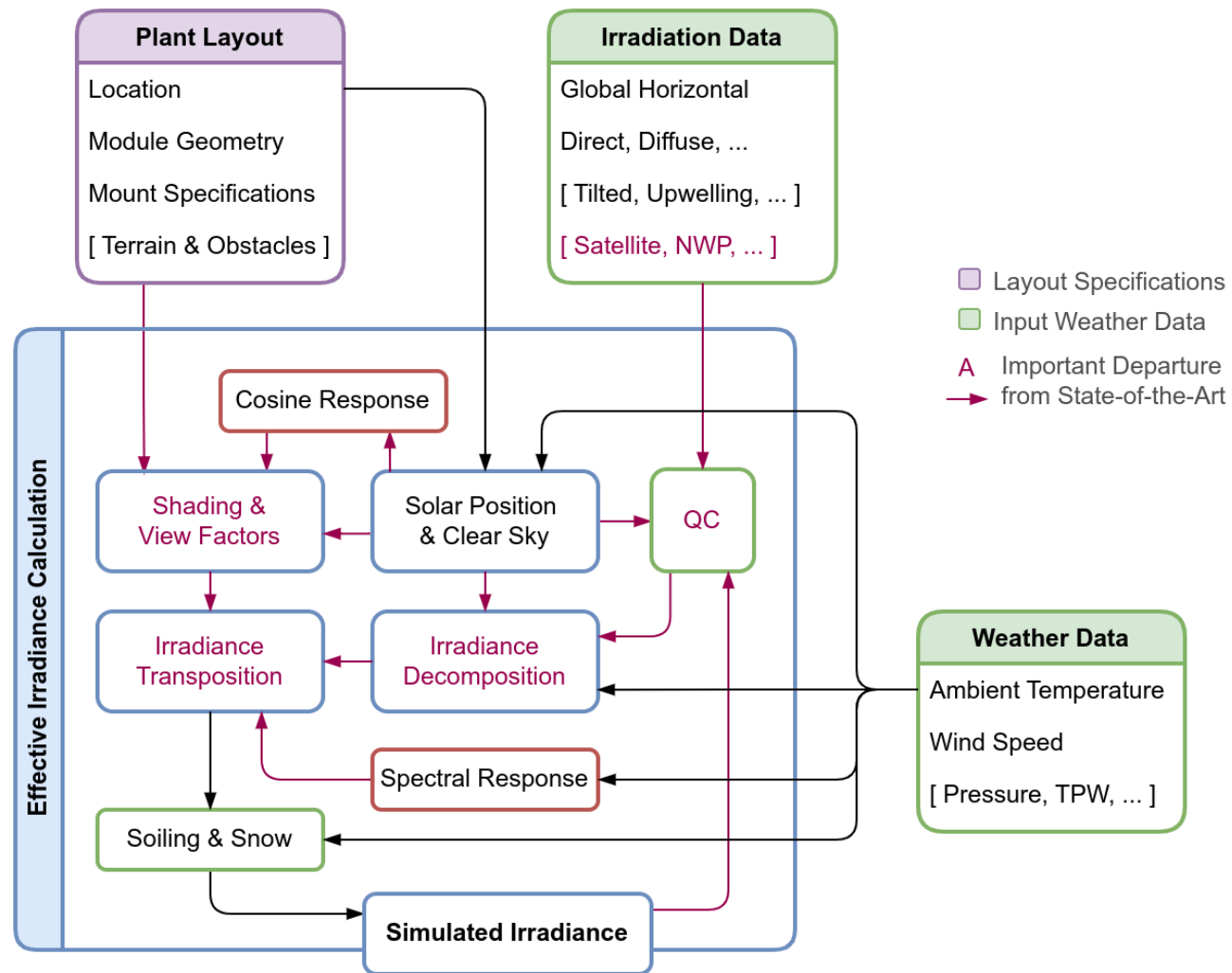
Hugo Capdevila[†]



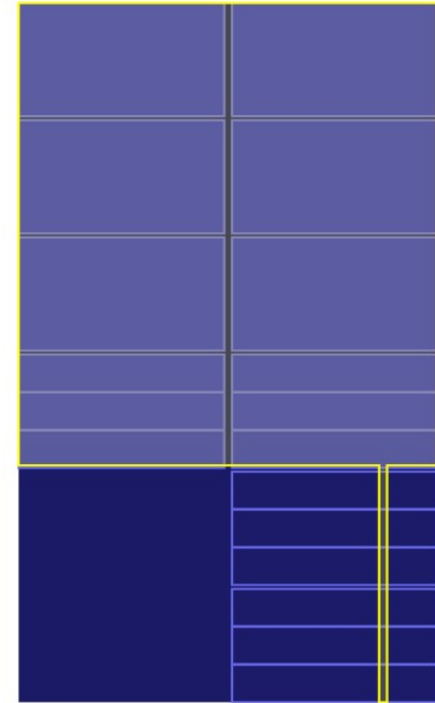
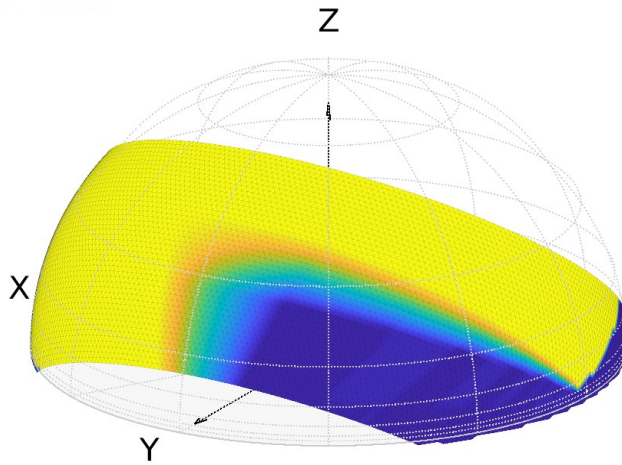
Overview



Part 1/3

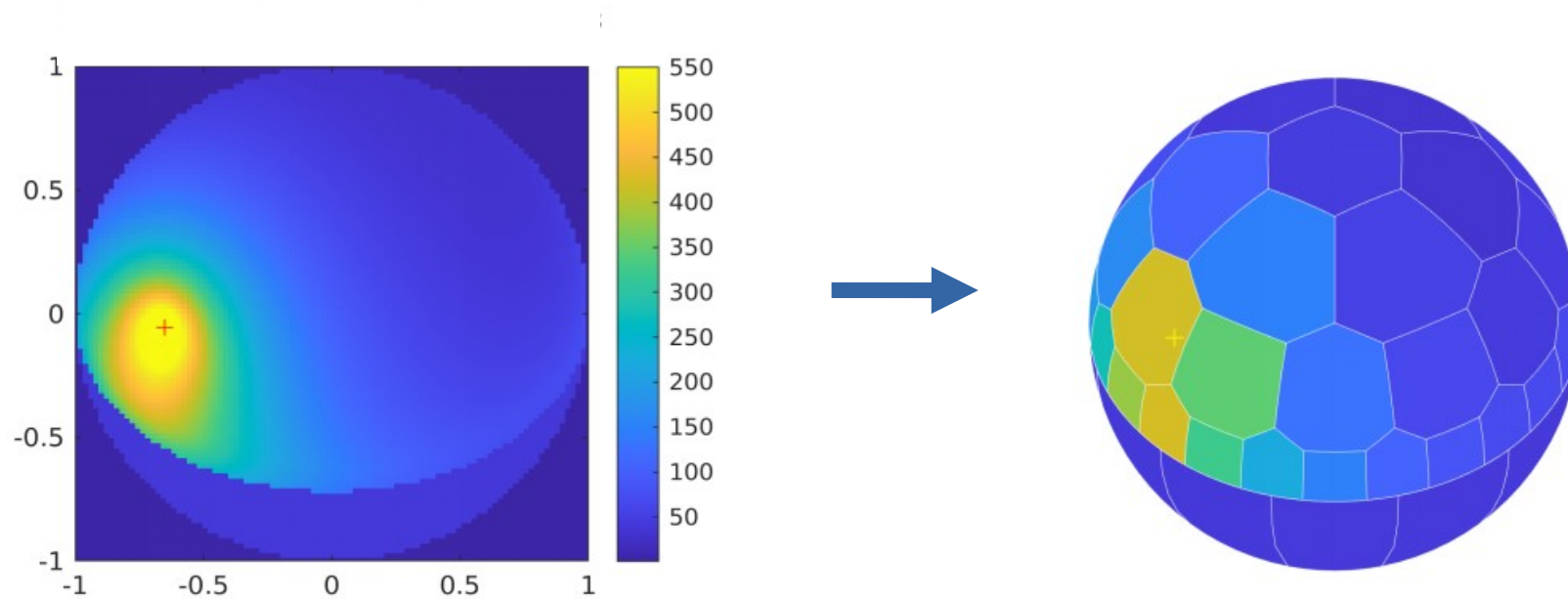


Grid-based, sub-cell resolution shading



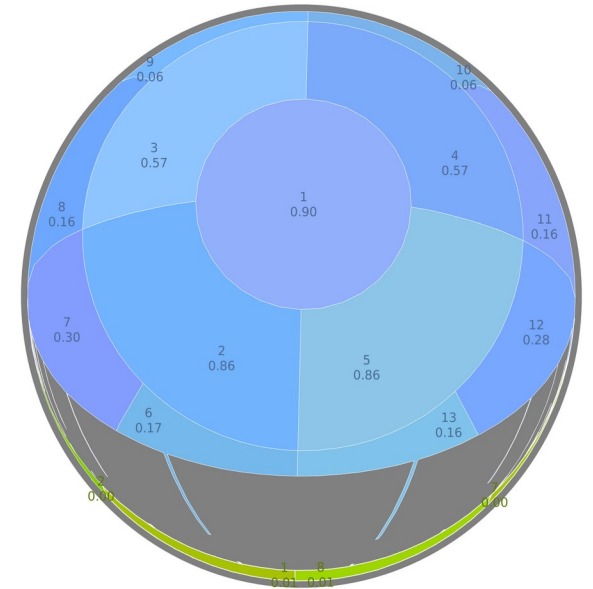
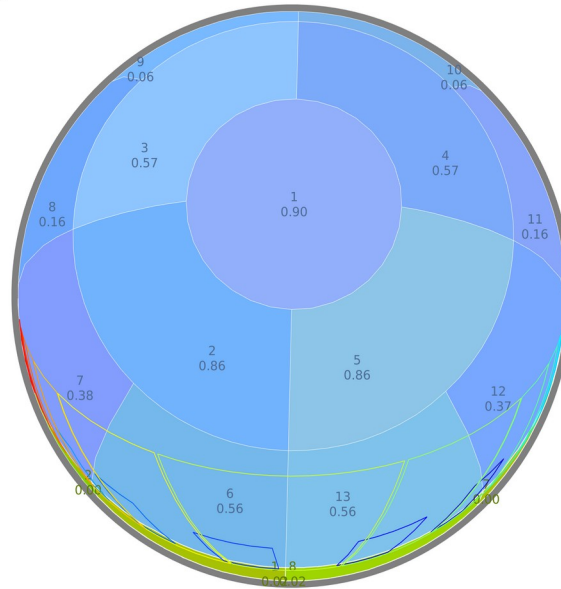
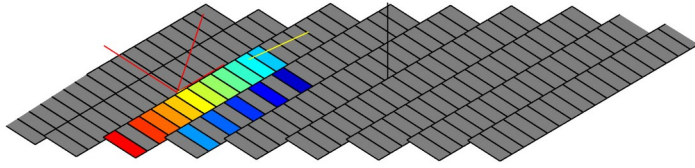


Fully anisotropic transposition





Fully anisotropic diffuse shading

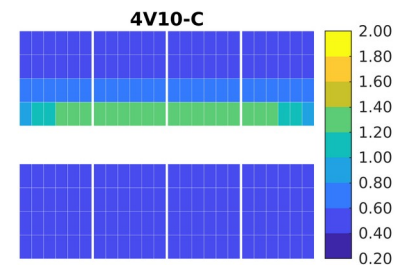
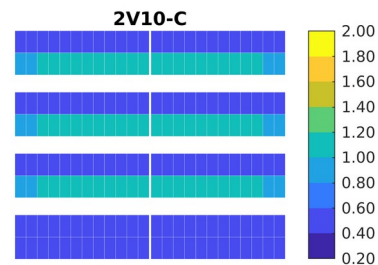
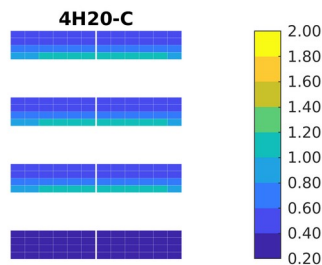
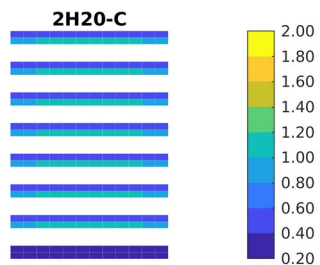




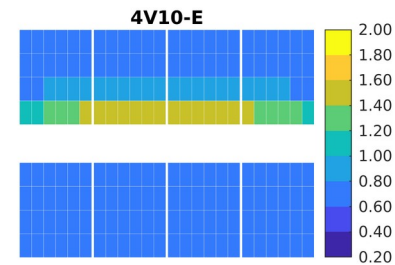
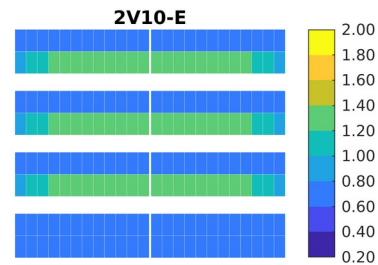
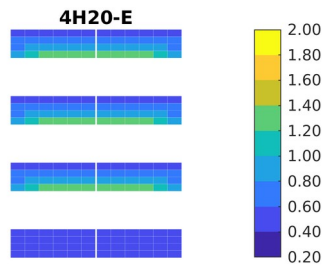
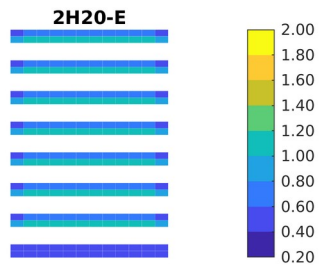
Fully anisotropic diffuse shading

CDM43 vs ISO+CS (RMS*)

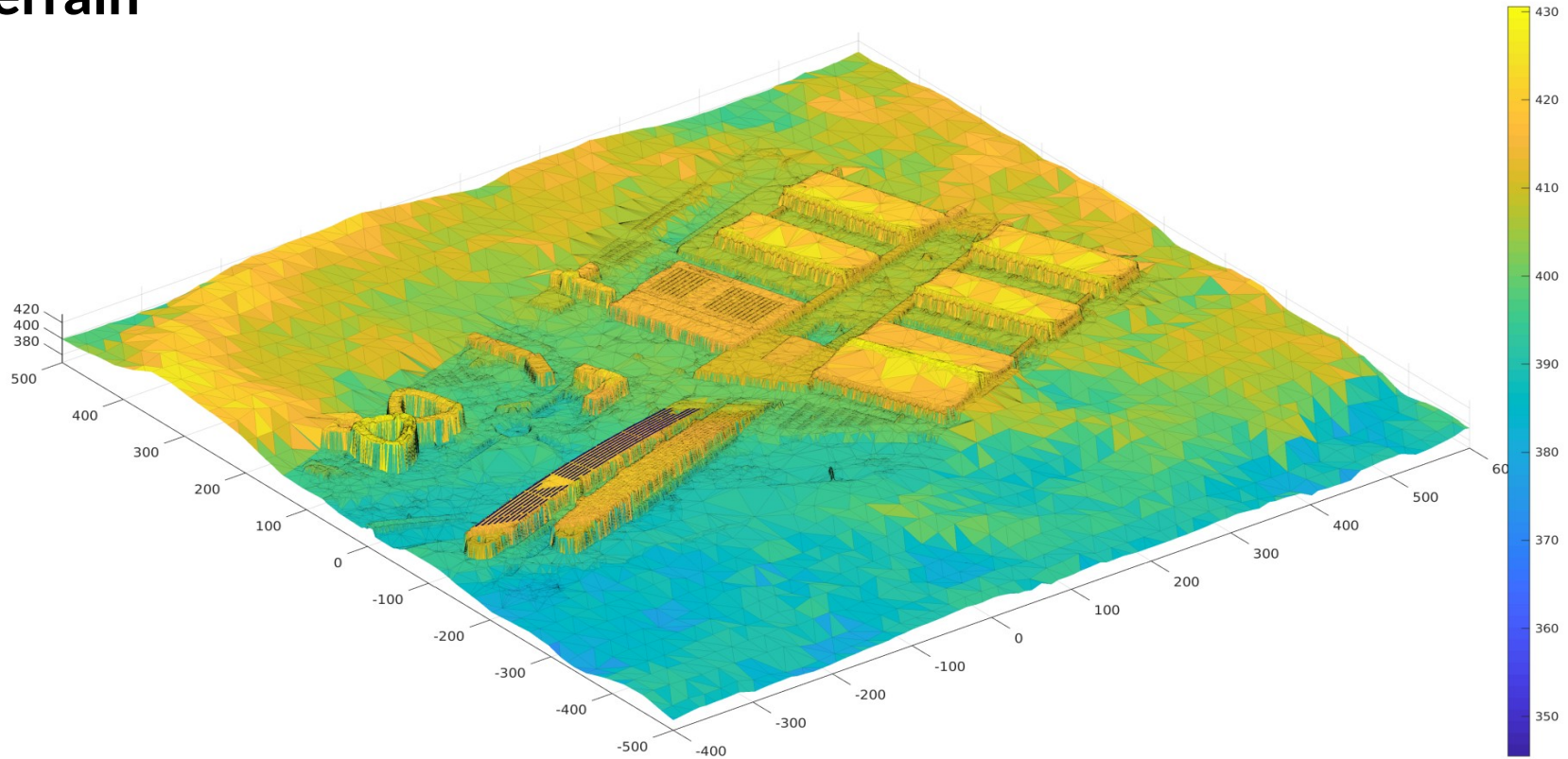
Cocoa, Florida
28° N, 80° W, 12 mASL



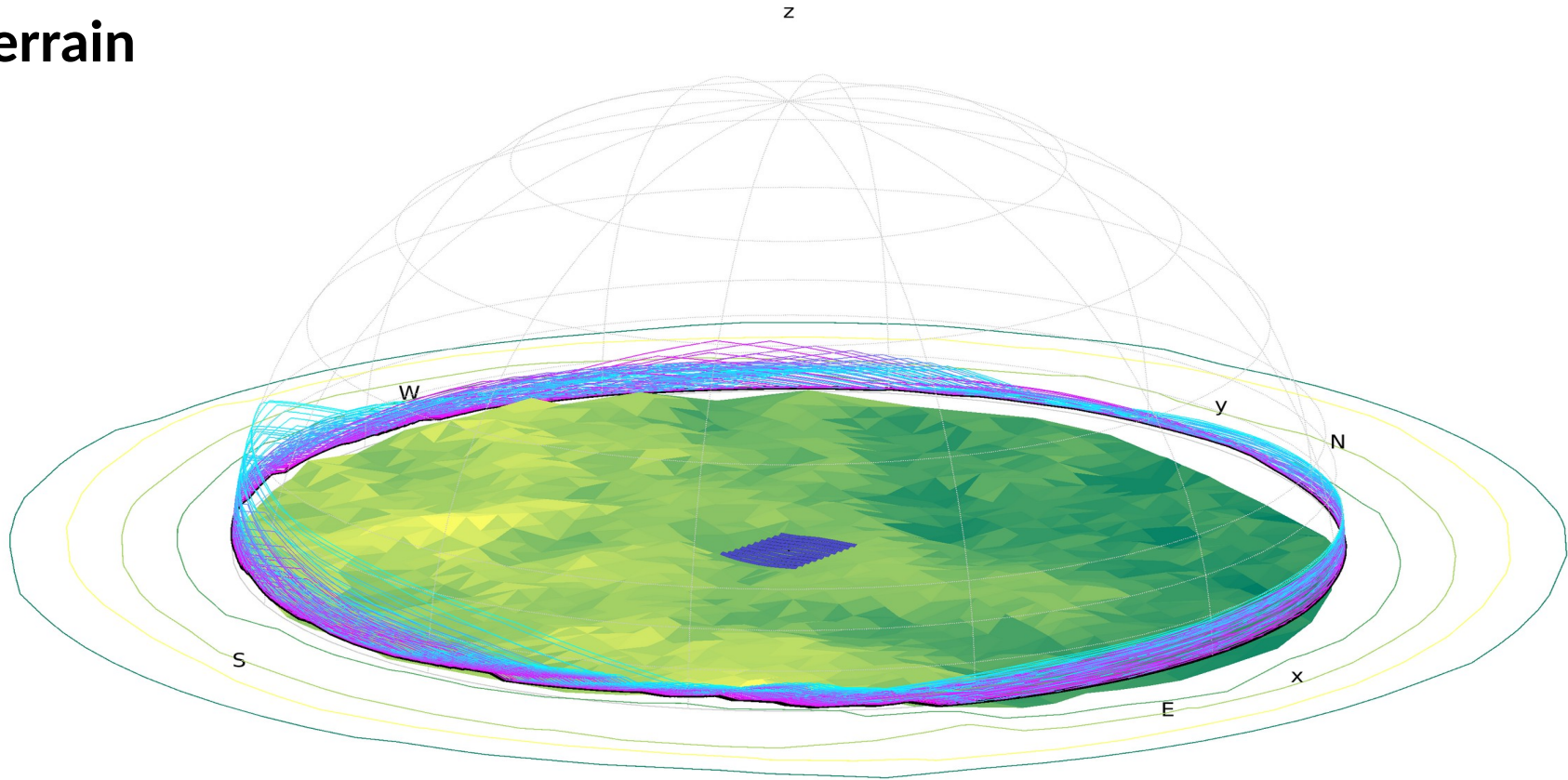
Eugene, Oregon
44° N, 123° W, 145 mASL



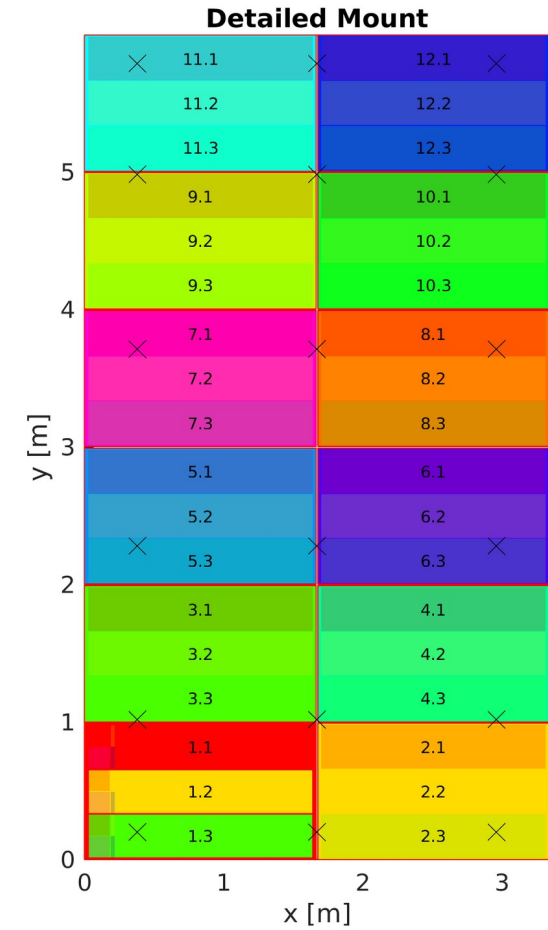
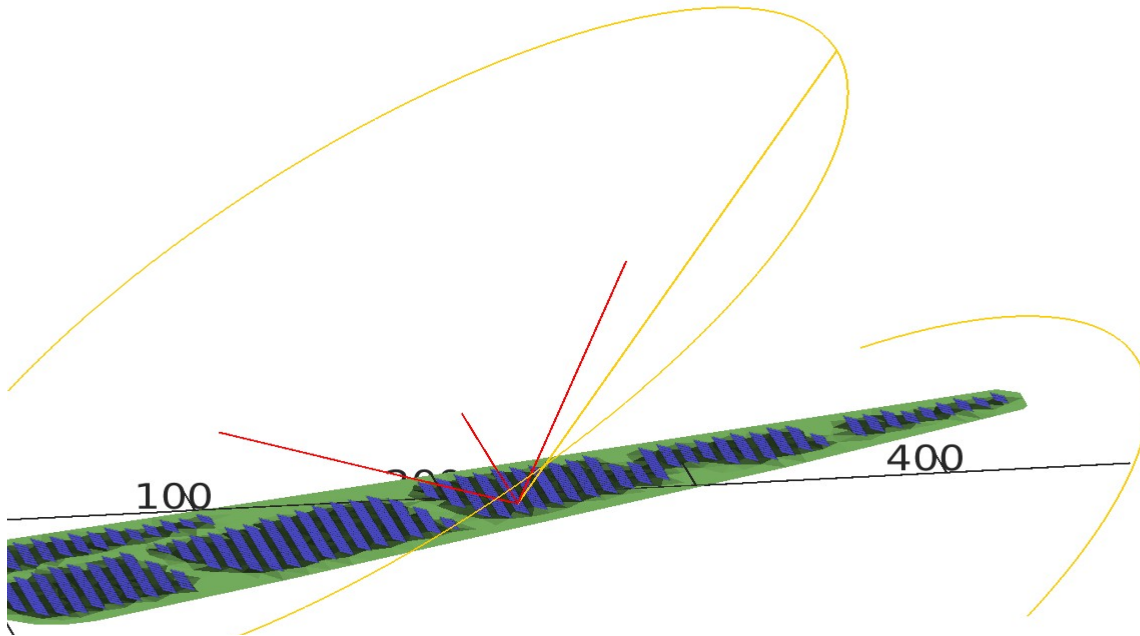
Terrain



Terrain



Layout



Meteorological Data

- Dedicated class

~ YAML sensor config.

~ Meta-Data

- Location
- Summarization

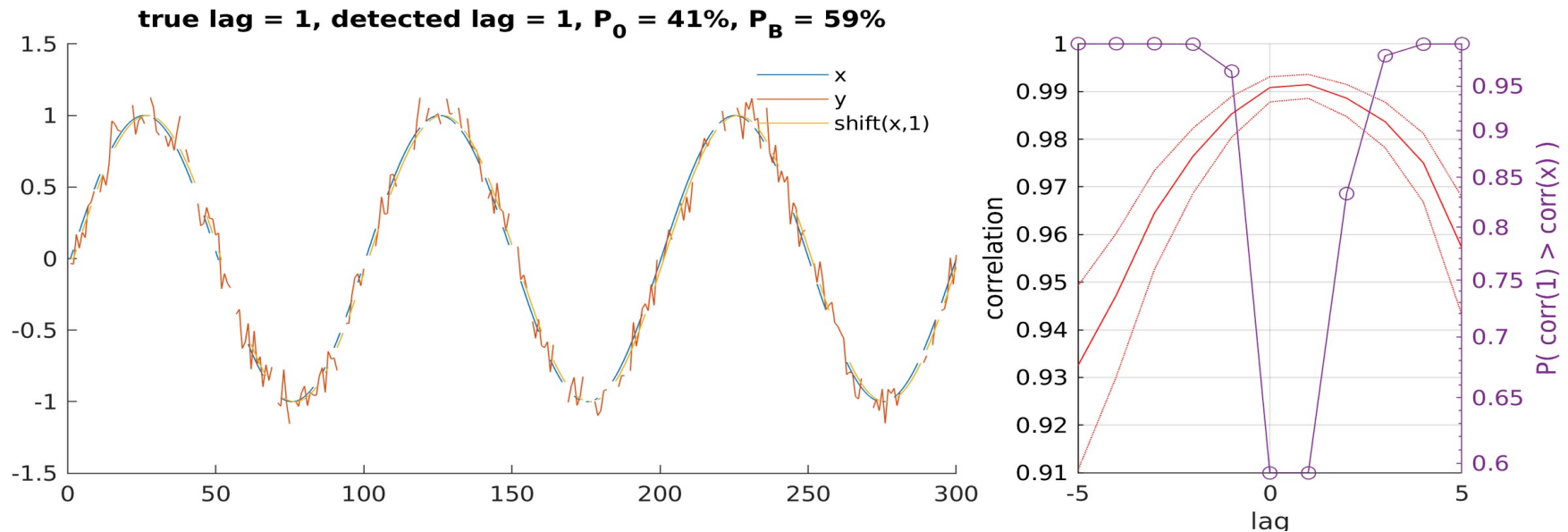
~ Non destructive flags

~ Uncertainty

```
- ID: Analog_GTI_Avg
  type: GTI
  model: Si-V-10TC
  info: Ref. cell at platform
  location: [9.189, 48.694, 423.3]
  mount:
    - tilt: 25.0
    - azimuth: 17.3 S2E
    - type: 0a
  zero_offset: 5.0
  calibration: 5.0
  temp_response: 0.1
  azimuth_response: 0.0
  cosine_response: 60.0
  tilt_response: 0.0
  fIAM: []
```

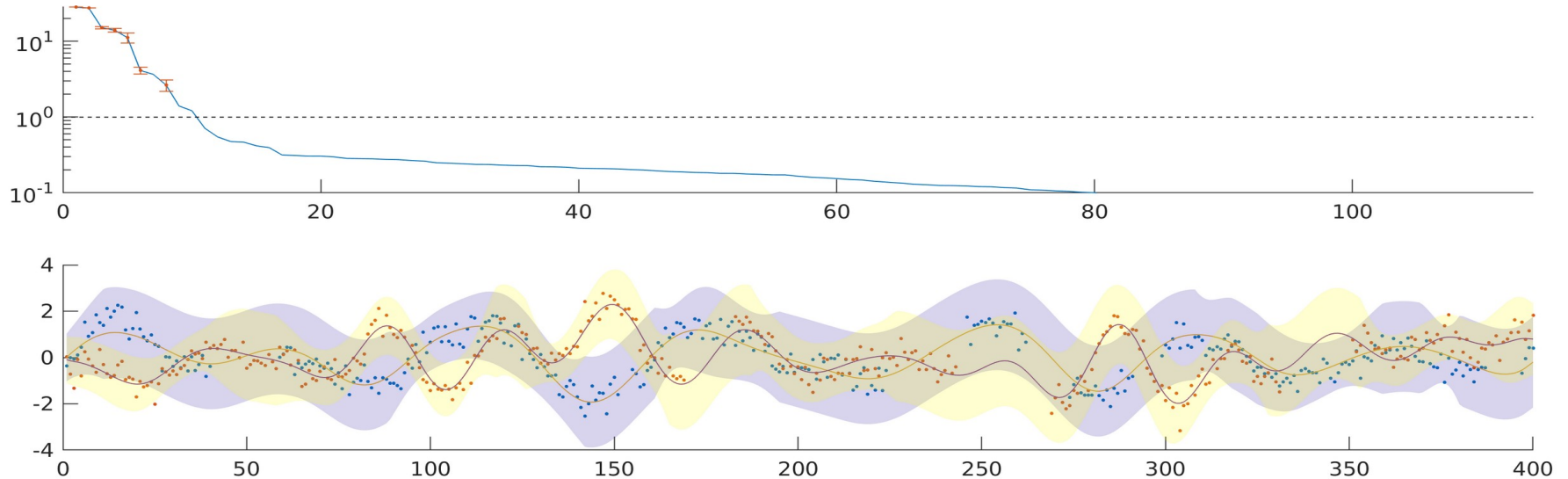
Meteorological Data

- Quality Control (CIE, BSRN, clear-sky, uncertainty, ...)
- Detection of common issues (units, time offset & summarization, ...)

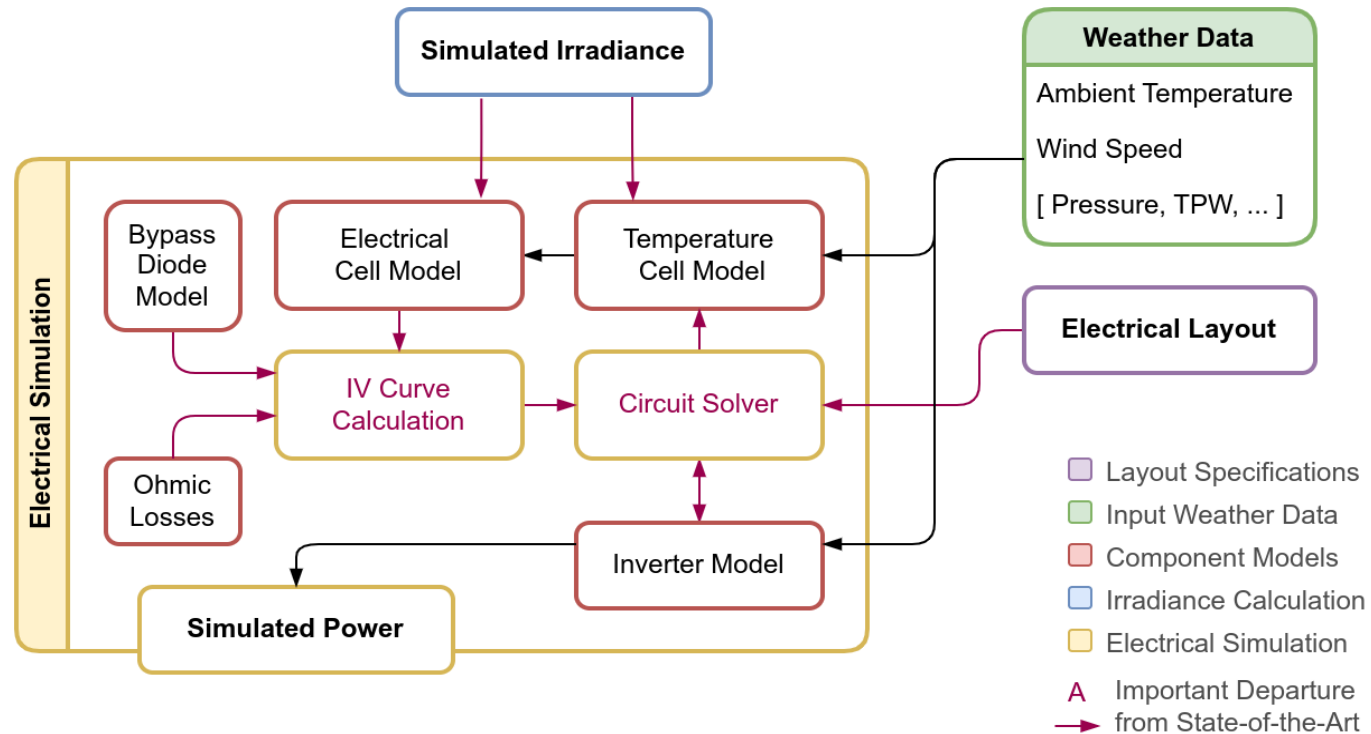


Meteorological Data

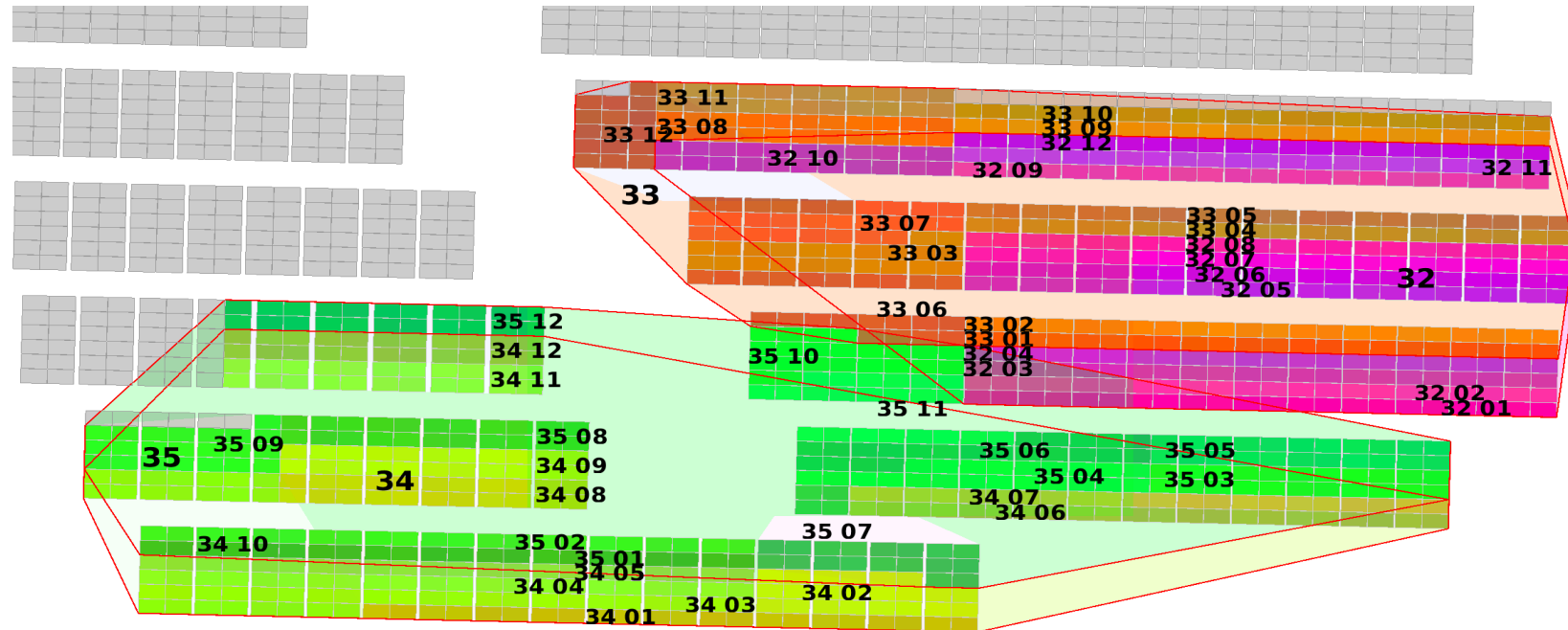
- Gap filling of ancilliary variables (MSSA)
- Completion with MERRA / CAMS / defaults

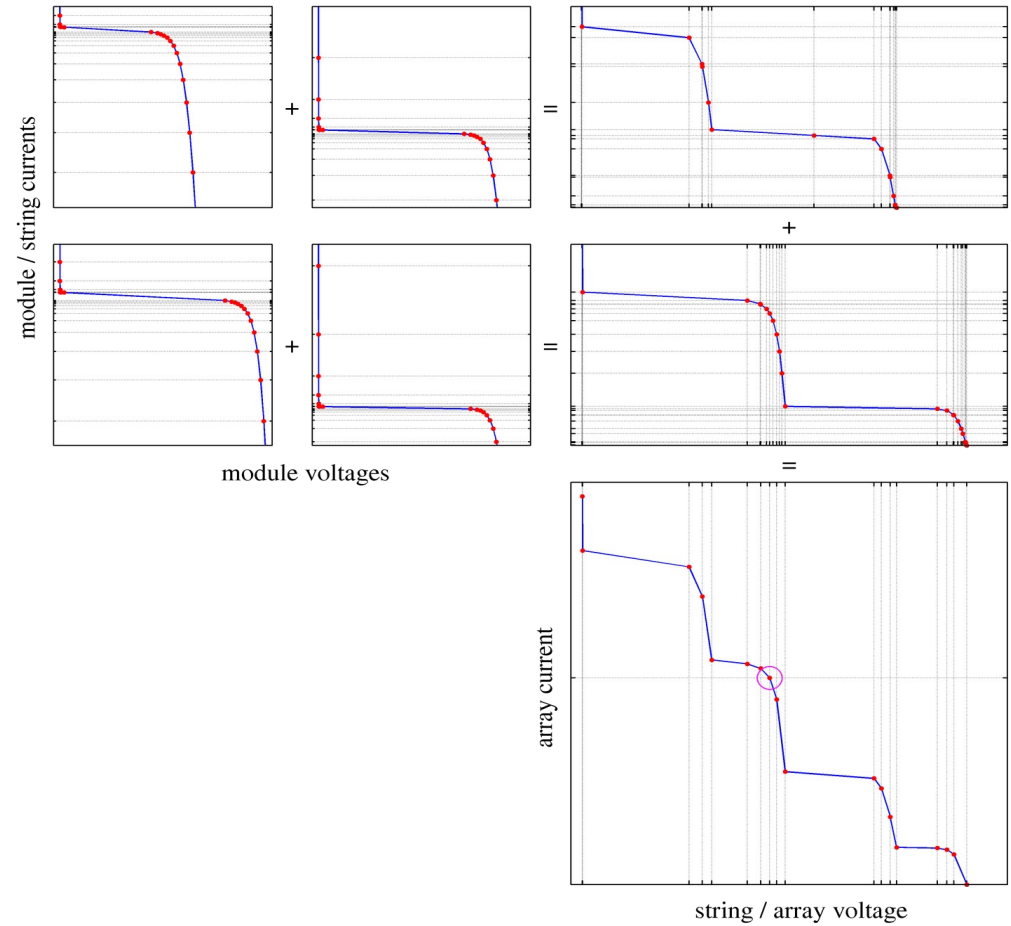


Part 2/3



Electrical Layout

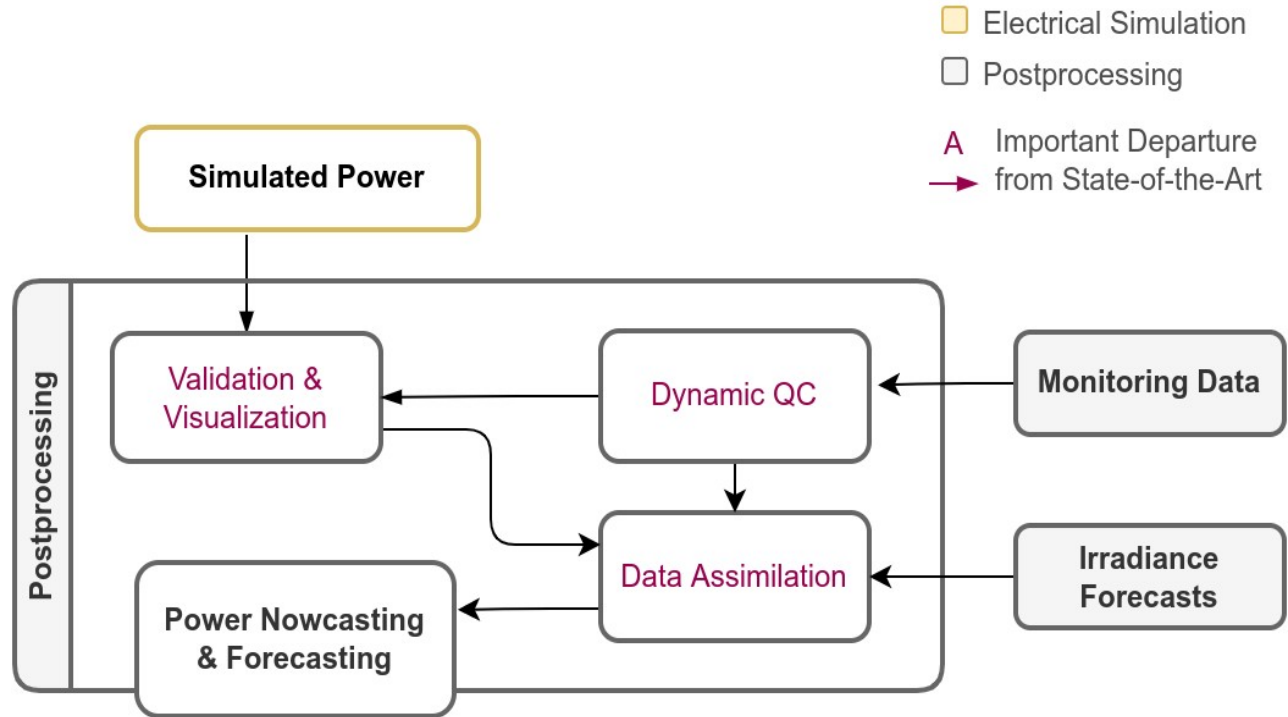




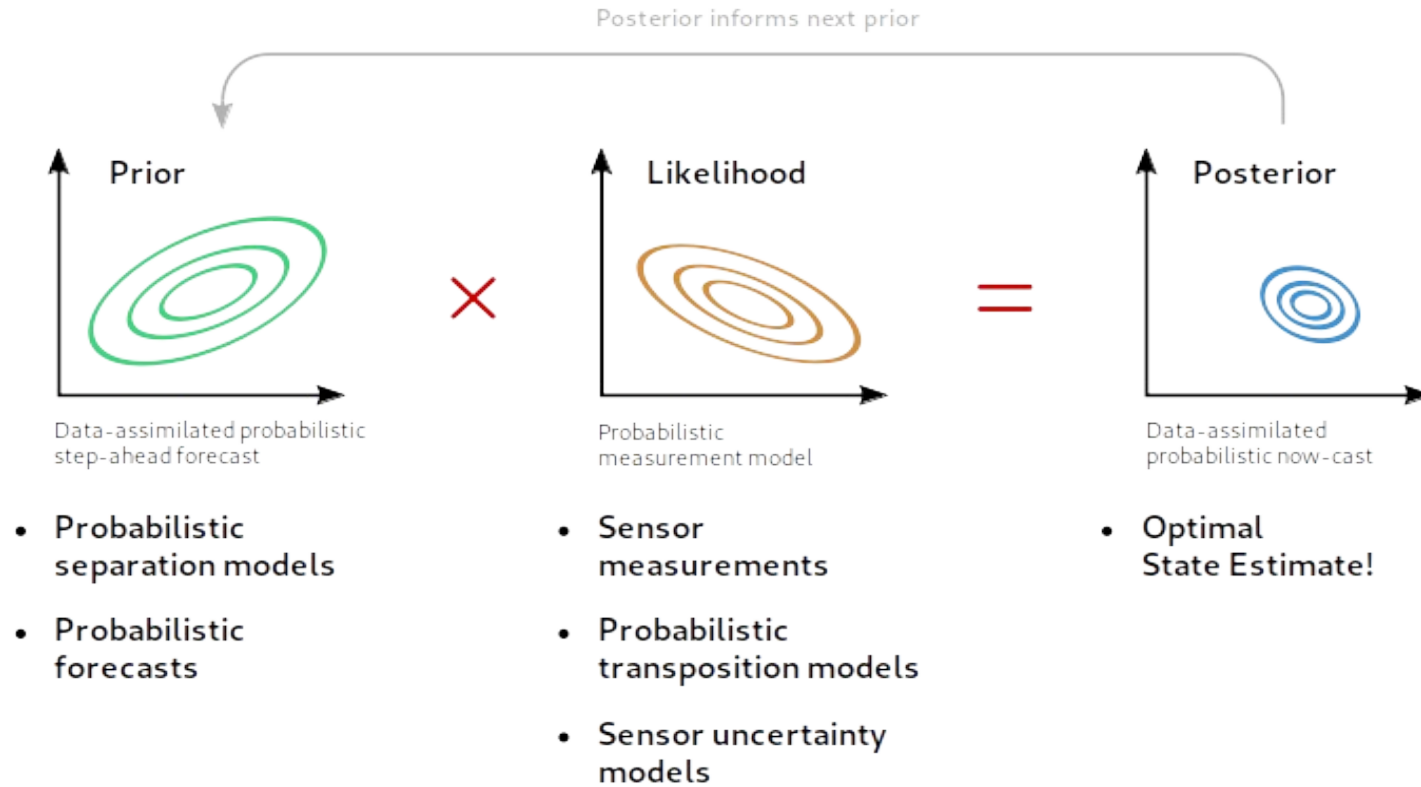
- Ported & Optimized
 - ~ ODM* (PVsyst+)
 - ~ MDPWL approximation
 - ~ Series-parallel addition



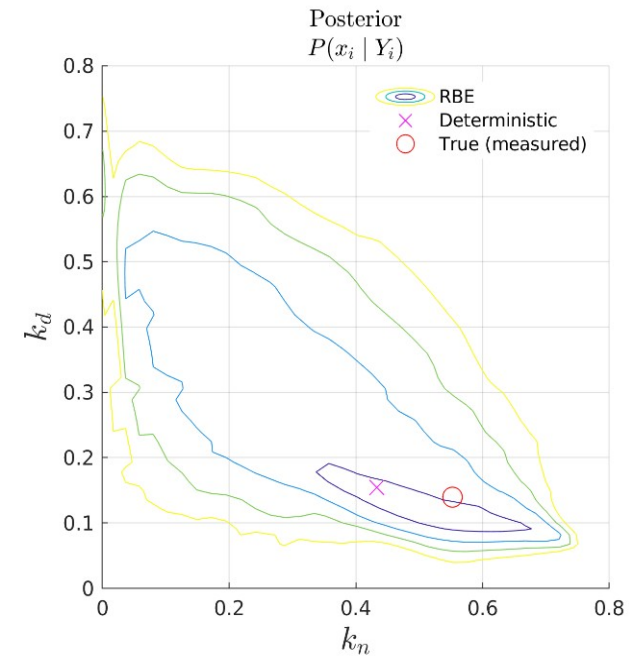
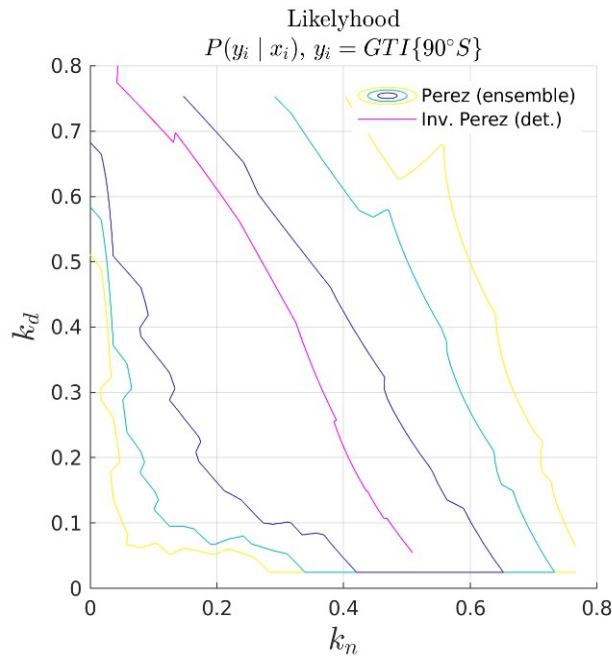
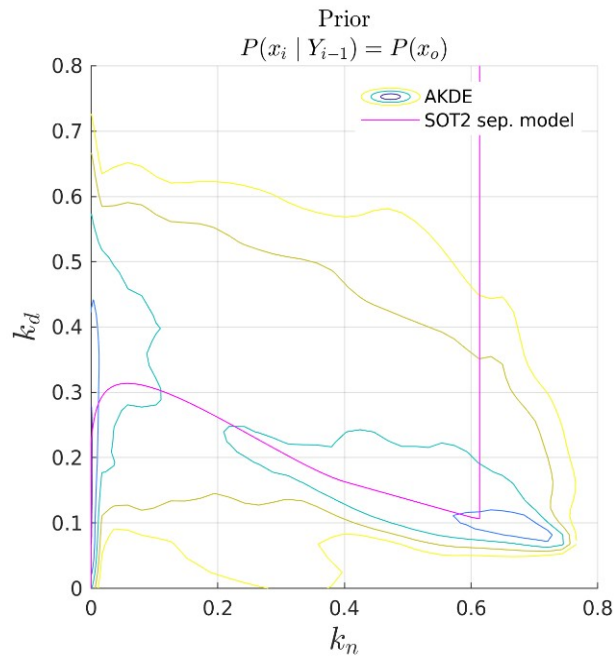
Part 3/3



Recursive Bayesian Estimation Framework for Data Assimilation

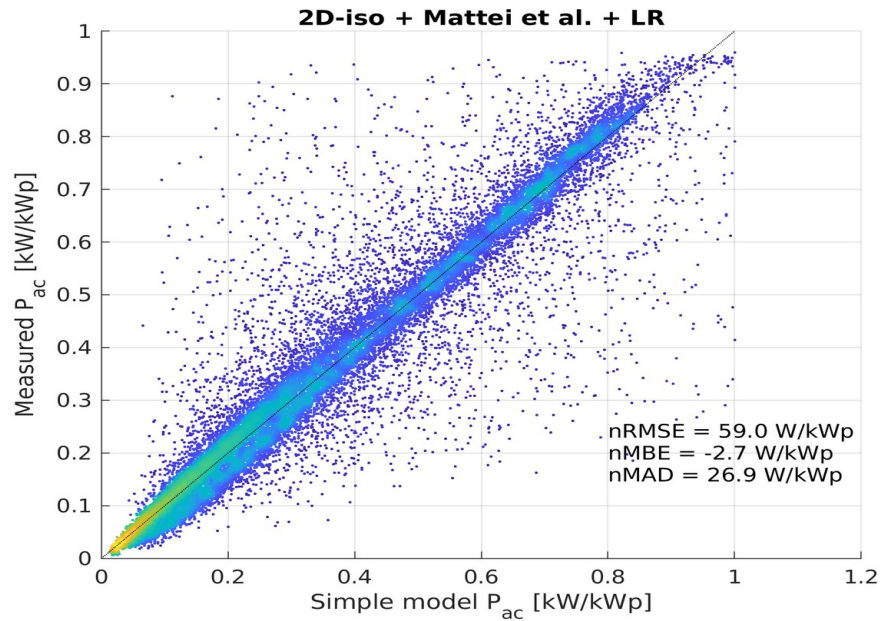


Recursive Bayesian Estimation Framework for Data Assimilation

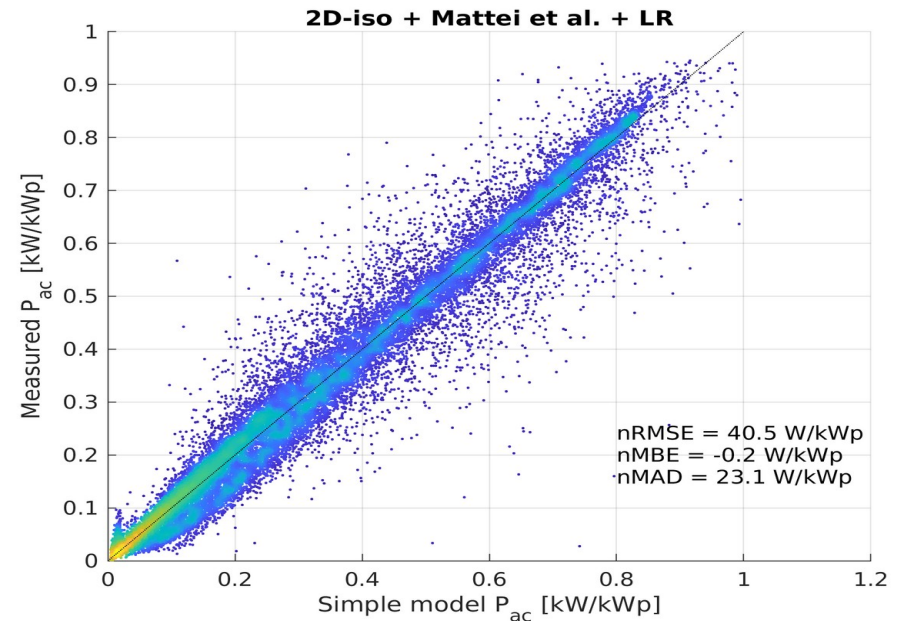


Example of RBE correction

Original



RBE - prior on $kn \cdot kd$, GHI + RSI + GTI 30°



<https://github.com/martinherrerias/solecito>

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