

Chemical Data Assimilation

Sensor

- ✓ Automated instrument data acquisition
- ✓ Containerized processing/storage pipeline
- ✓ NodeRed
- ✓ InfluxDB
- ✓ Grafana
- ✓ Preliminary data collection (>12 hours indoors)

Characterization of Photolysis

- ✓ Scraped MPI-Mainz Spectral Atlas (>8000 data files)
- ✓ Wrote GPR implementation for MLJ in Julia
- ✓ Performed GPR fits for σ , Φ
- ✓ Collected irradiance spectra, I
- ✓ Combined I, σ , Φ to determine photolysis rates
- 🕒 Paper (in progress)

Data Assimilation + Chemical Mechanism

- ✓ Developed parser for MCM (> 16,000 rxns) mechanism
- ✓ Implemented AutoChem + Ion Chemistry mechanism
- ✓ Developed Julia code for integration of Kintetics
- ✓ Implemented 4d-var Assimilation Code
- ✓ Implemented EKF Assimilation Code
- ✓ Preliminary Analysis for collected data
- 🕒 Mechanism refinement and further data collection
- 🕒 Paper