Additions to Pysat and CDAWeb: Availability of Datasets

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The Pysat Software Package

Stonebeck et al., 2018 and 2023

What is **pysat**?

- Python Satellite Data Analysis Toolkit
- Initially for in situ satellite measurements, but has expanded

What can you do with **pysat**?

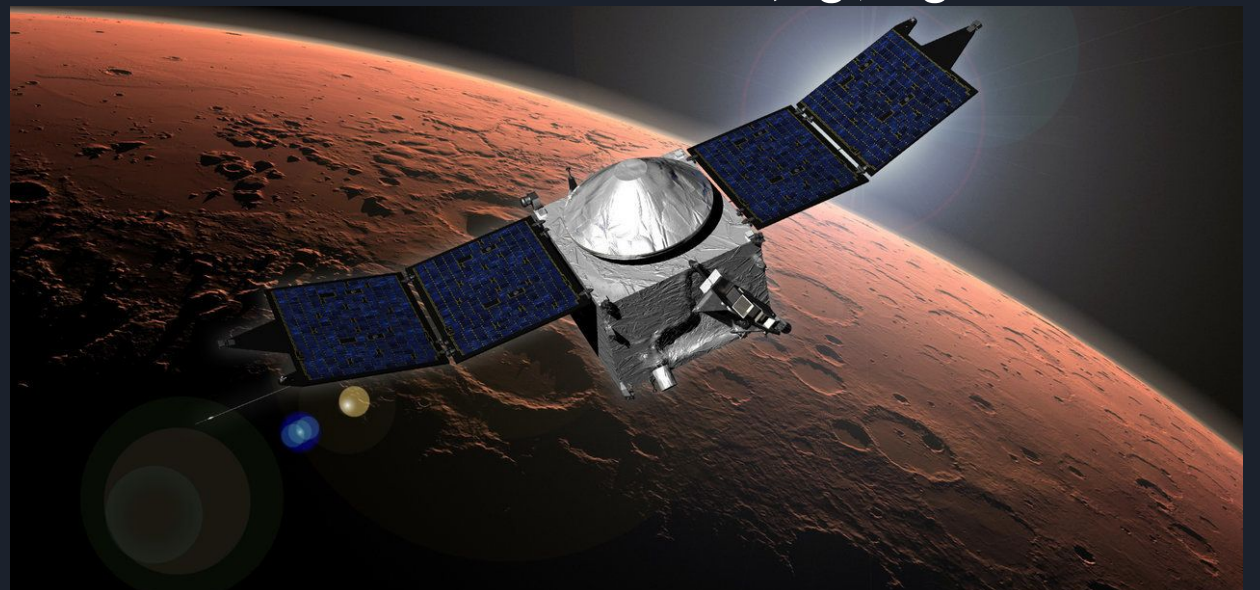
- Data management and analysis
- Find, download and load data from CDAWeb or locally
    - Coordinated Data Analysis Web
- Instrument independent analysis routines
- Add your own instruments!

Mars Global Surveyor (MGS) Dataset

- Magnetometer data from 1997 – 2006
- Additional data products
  - Interpolated spacecraft location to high resolution
  - Altitude (km) calculated with a fixed radius of 3389.5 km
  - Calculated magnetic field magnitude
- Public pysat management coming soon
- Data coming to CDAWeb, pending meta format approval

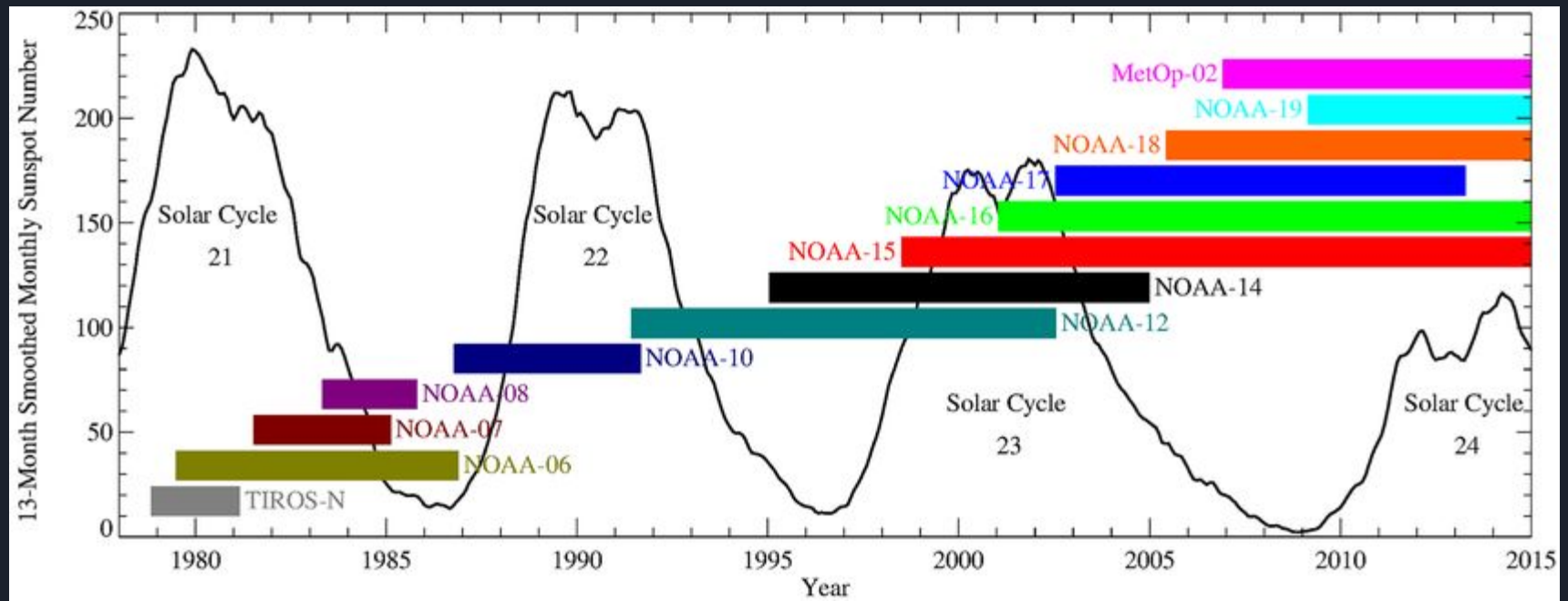
Mars Atmosphere and Volatile Evolution (MAVEN) in Pysat

- Pysat data management of two MAVEN datasets on CDAWeb coming soon
- MAVEN Magnetometer L2 sunstate 1-sec data
- Key parameter (kp) 4-sec data
  - Over 200 variables including LPW, SWEA, SWIA, STATIC, SPICE, MAG, and more
- Working towards additional datasets on CDAWeb (e.g., higher resolution data)



Polar Operational Environmental Satellite (POES)

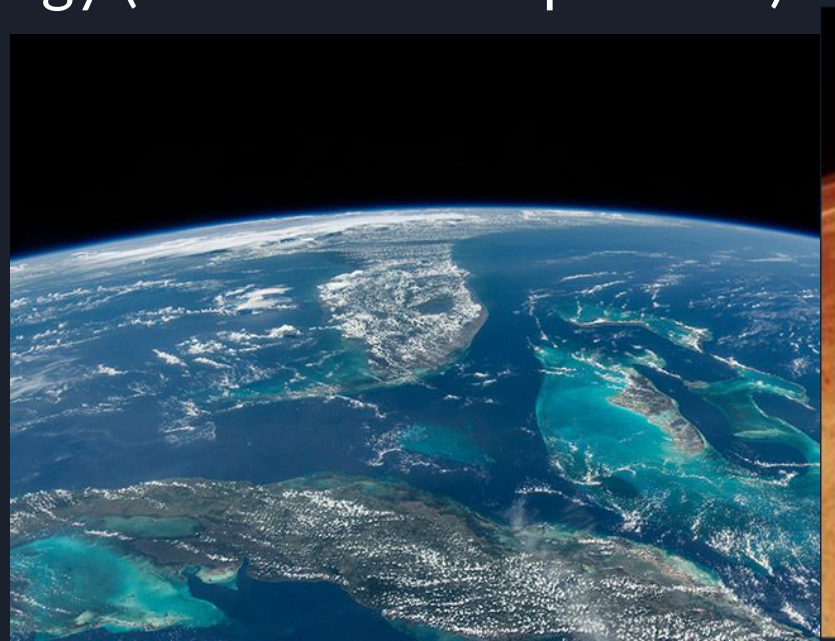
- Multiple different POES datasets via Joshua Pettit (Pettit et al., 2021)
  - MEPED: Medium energy proton and electron detector
  - Different from what is currently on CDAWeb
- Operational pysat code for locally stored level 2 data is written, not public



Lin et al., 2019

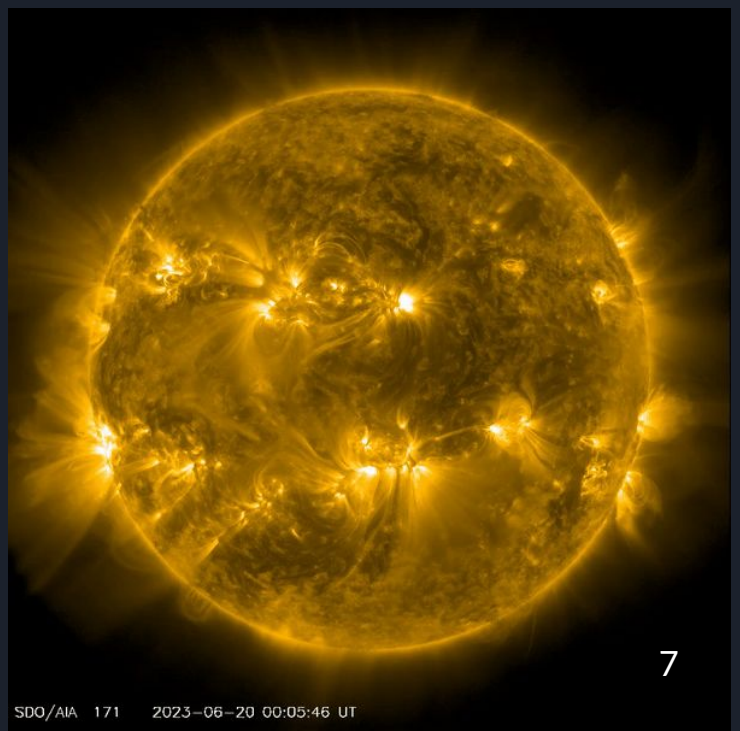
Scientific Potential

- Easier and more efficient comparisons between Mars and Earth datasets
- Solar activity and solar wind interactions at multiple points in the solar system
- Comparative planetology (let’s add more planets!)



Summary

- Use pysat: pysat.readthedocs.io, github.com/pysat/pysat
- Use CDAWeb: cdaweb.gsfc.nasa.gov
- Availability of “new” datasets coming soon
    - MGS, MAVEN… a bit later POES
- Increase use of pysat and CDAWeb
- Increase accessibility and scientific potential



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Citations

Stoneback, Russell, Klenzing, Jeff, Burrell, Angeline G., Pembroke, Asher, Spence, Carey, Depew, Matthew, Smith, Jonathon M., Fuller, Ryan, Von Bose, Veronica, Hargrave, Nathaniel, Iyer, Gayatri, & Leite, Silvio. (2023). pysat/pysat: v3.1.0 (v3.1.0). Zenodo. https://doi.org/10.5281/zenodo.7992415

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