Solar Spectral Irradiance: lyman Alpha, MagnEsium II, and Sigma k proxiEs (SSIAMESE)

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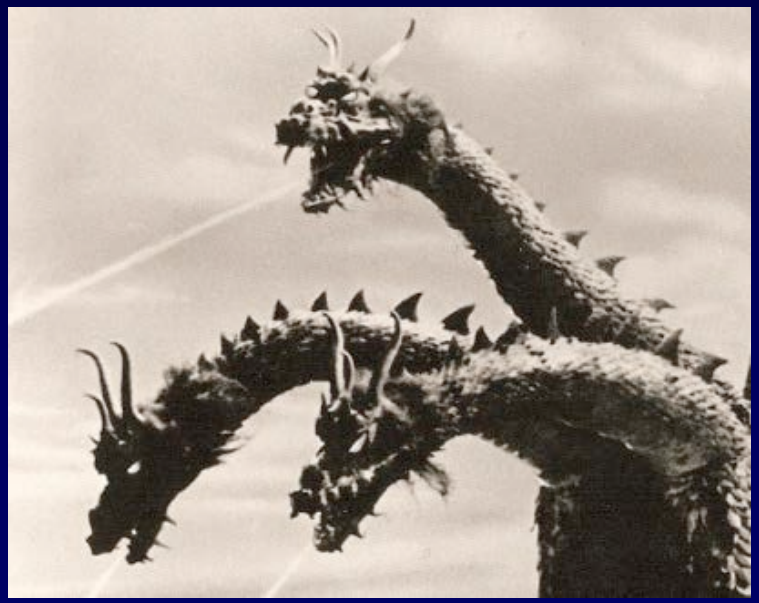
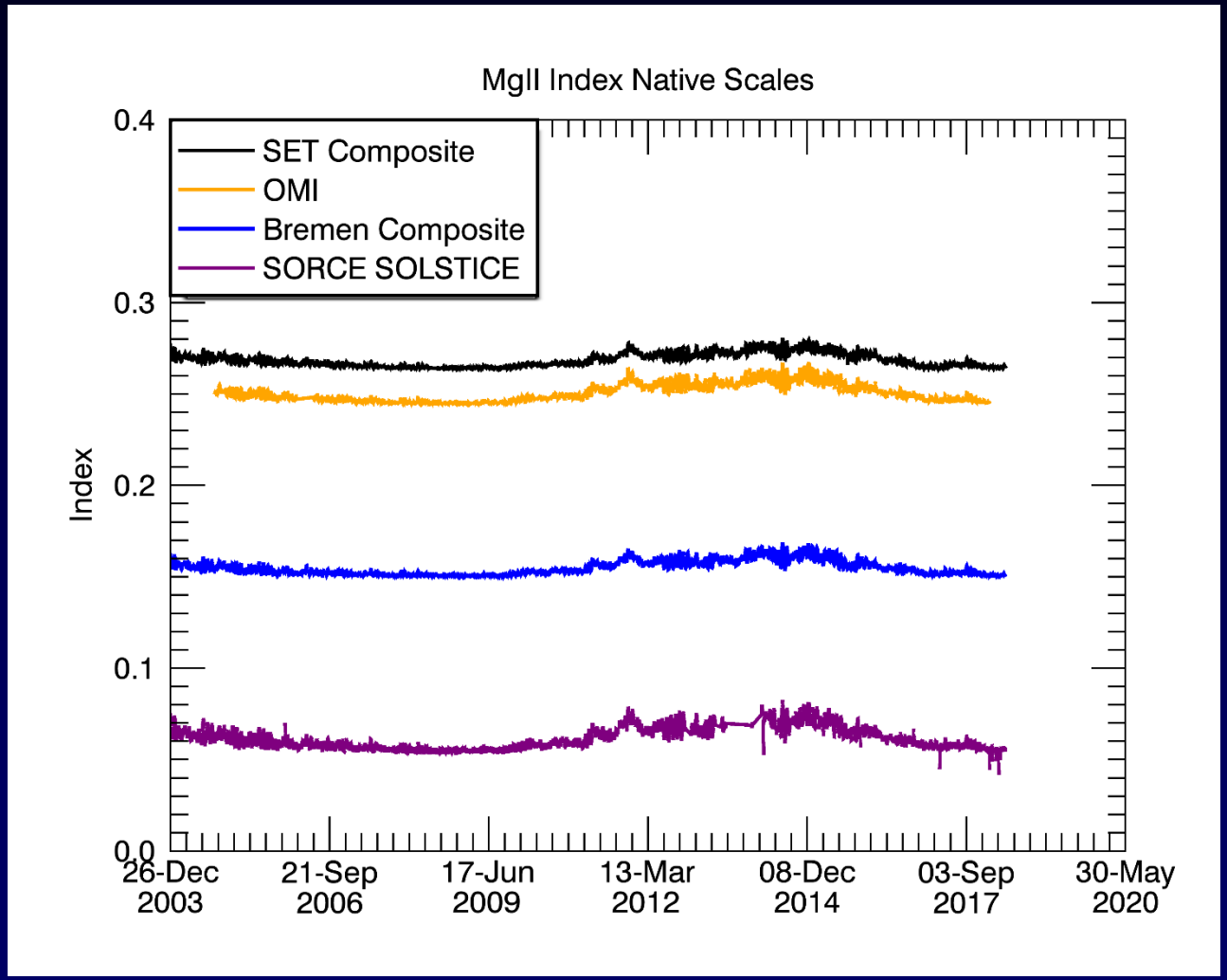
SSIAMESE Objectives

- Improve the SFO proxies
- Improve the Lyman alpha composite
- Improve the Magnesium II composite

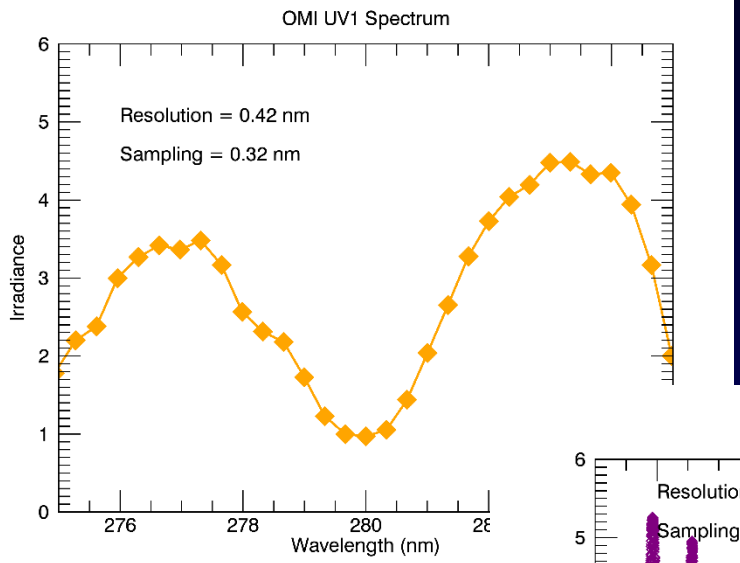


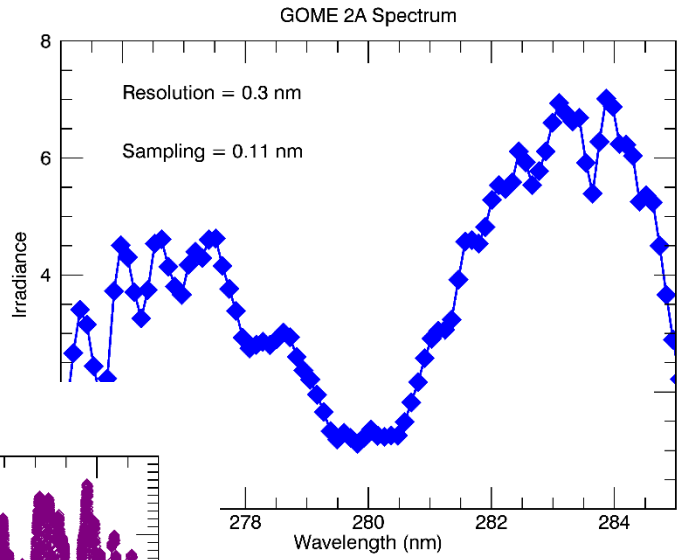
Lyman alpha

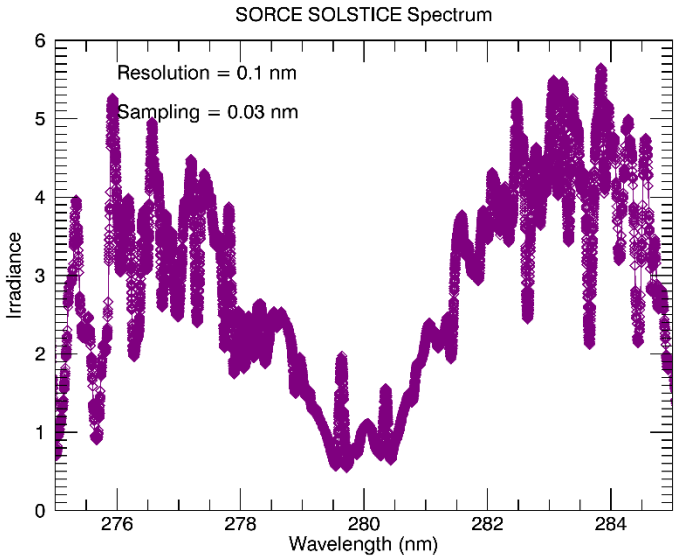
Fundamental MgII Problem



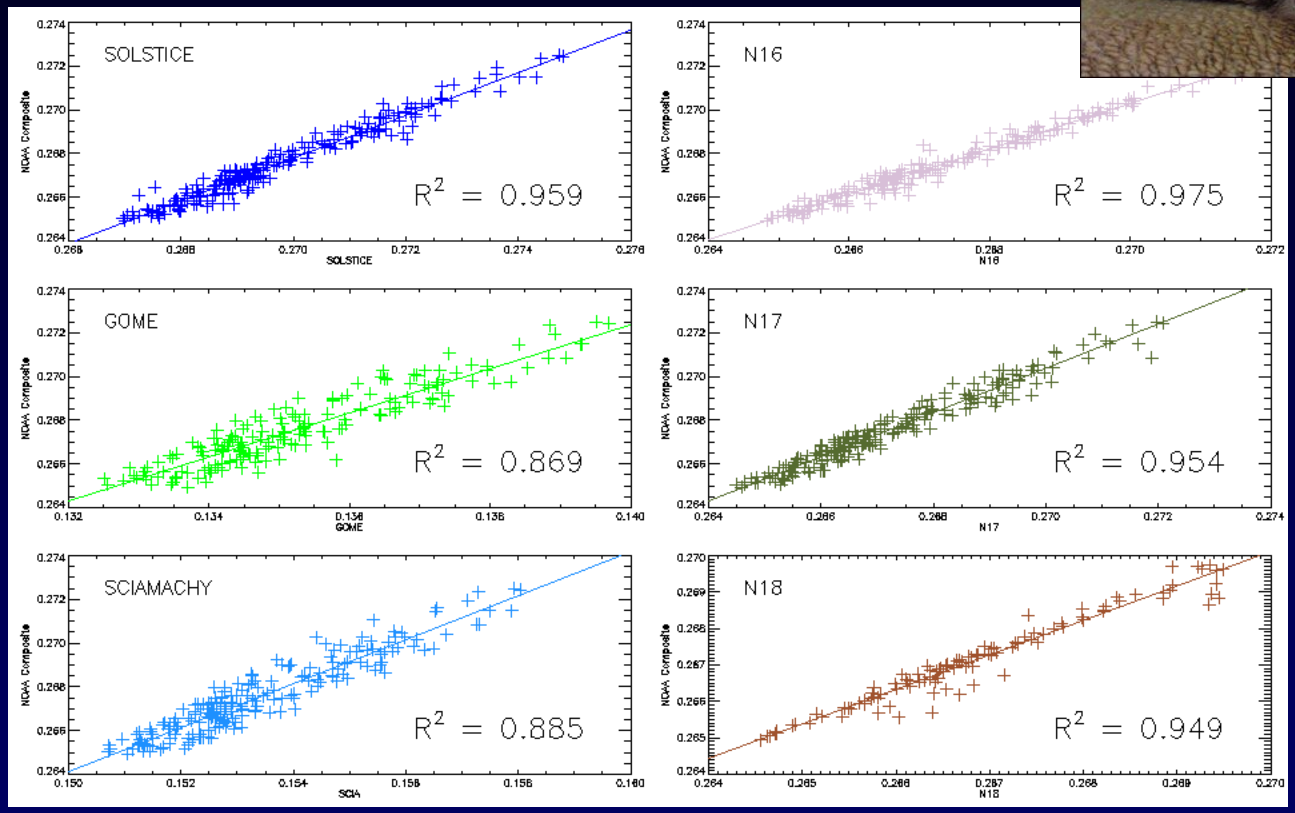
Why are the measurements not all the same?



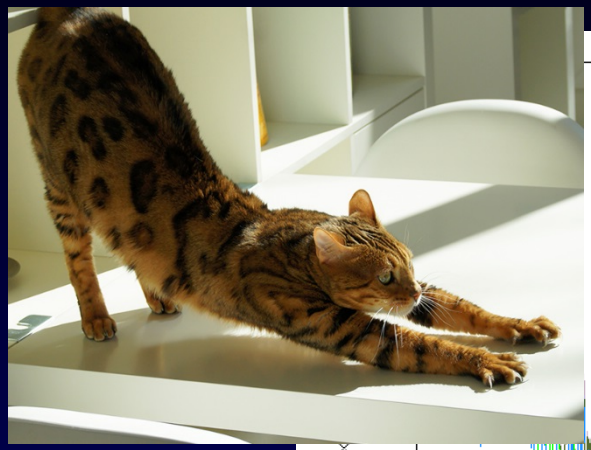


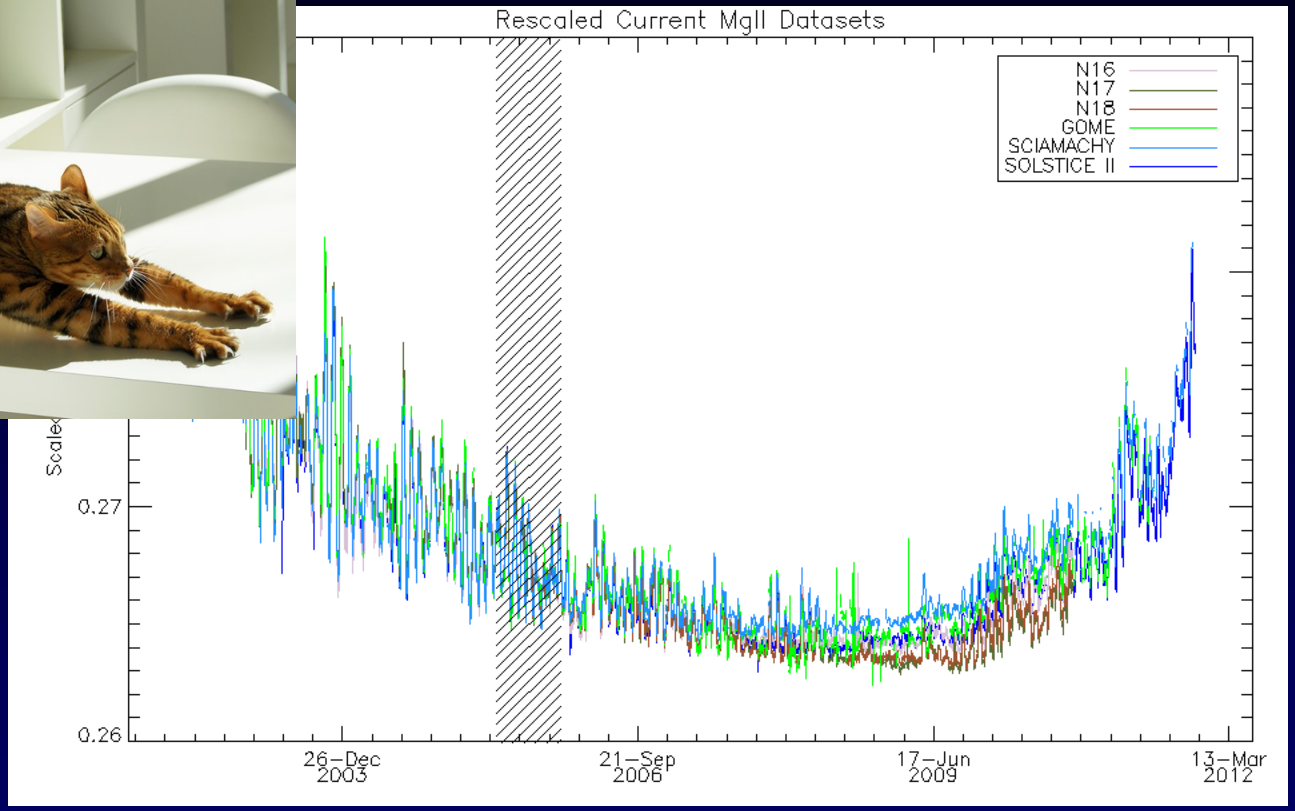


Old Solution



Is there a problem?





Uncorrected trends in one dataset can be transferred to other datasets.
The magnitude can be a significant fraction of the solar cycle amplitude.

Magnesium II Mafia (2)

New Solution

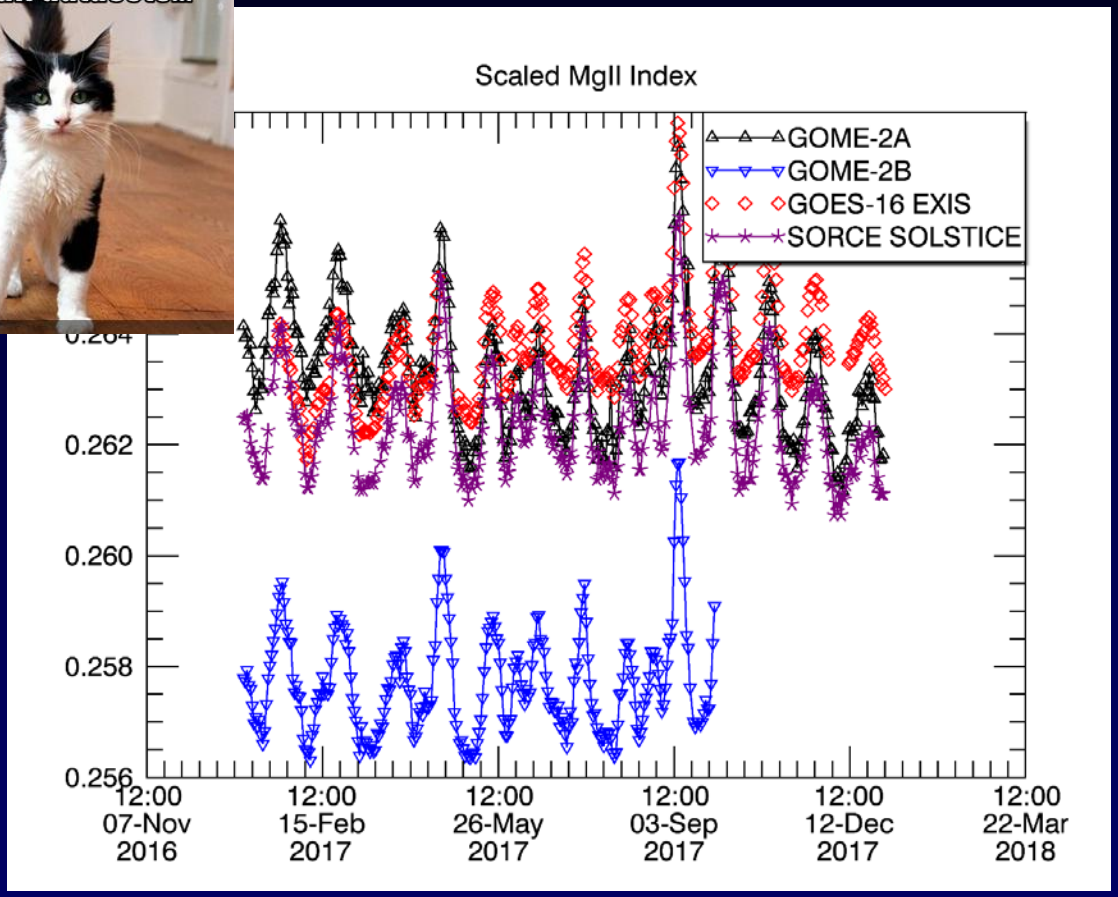
- "Self-scaling"
- Degrade spectral resolution to standard 1.1 nm with 0.2 nm sampling
- Calculate "classic" (Heath & Schlesinger 1986) index
- Use linear correlation between native and classic to determine scaling, rather than scaling to another dataset.

Benefits of New?

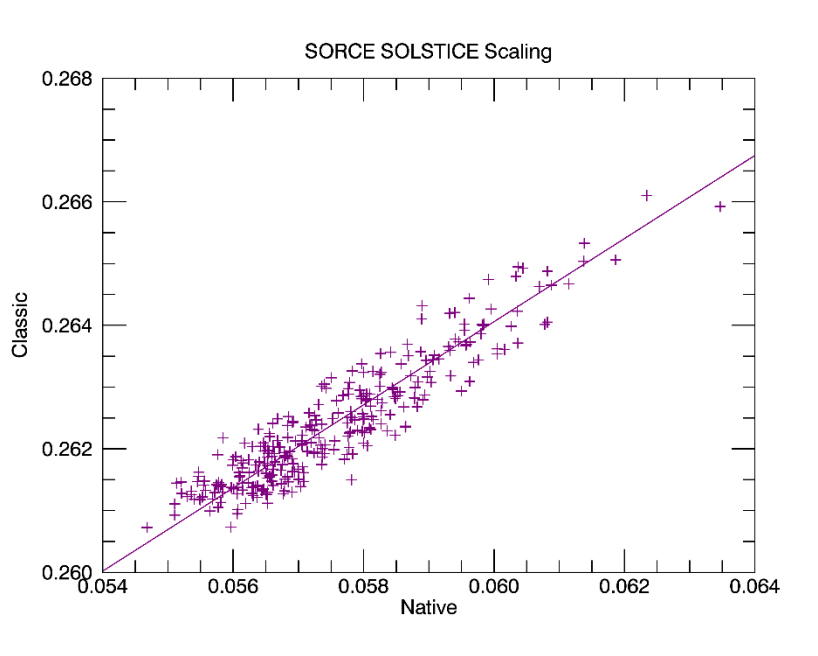
- Does not require daisy-chained series of overlapping datasets.
- Uses instrument teams' best algorithms.

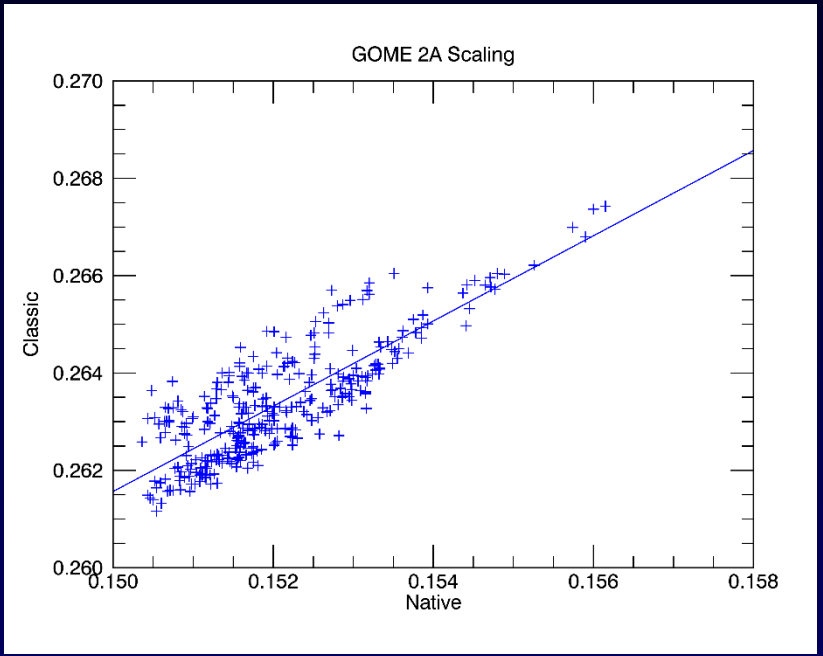
Self-Scaling Results

Nothing is perfect



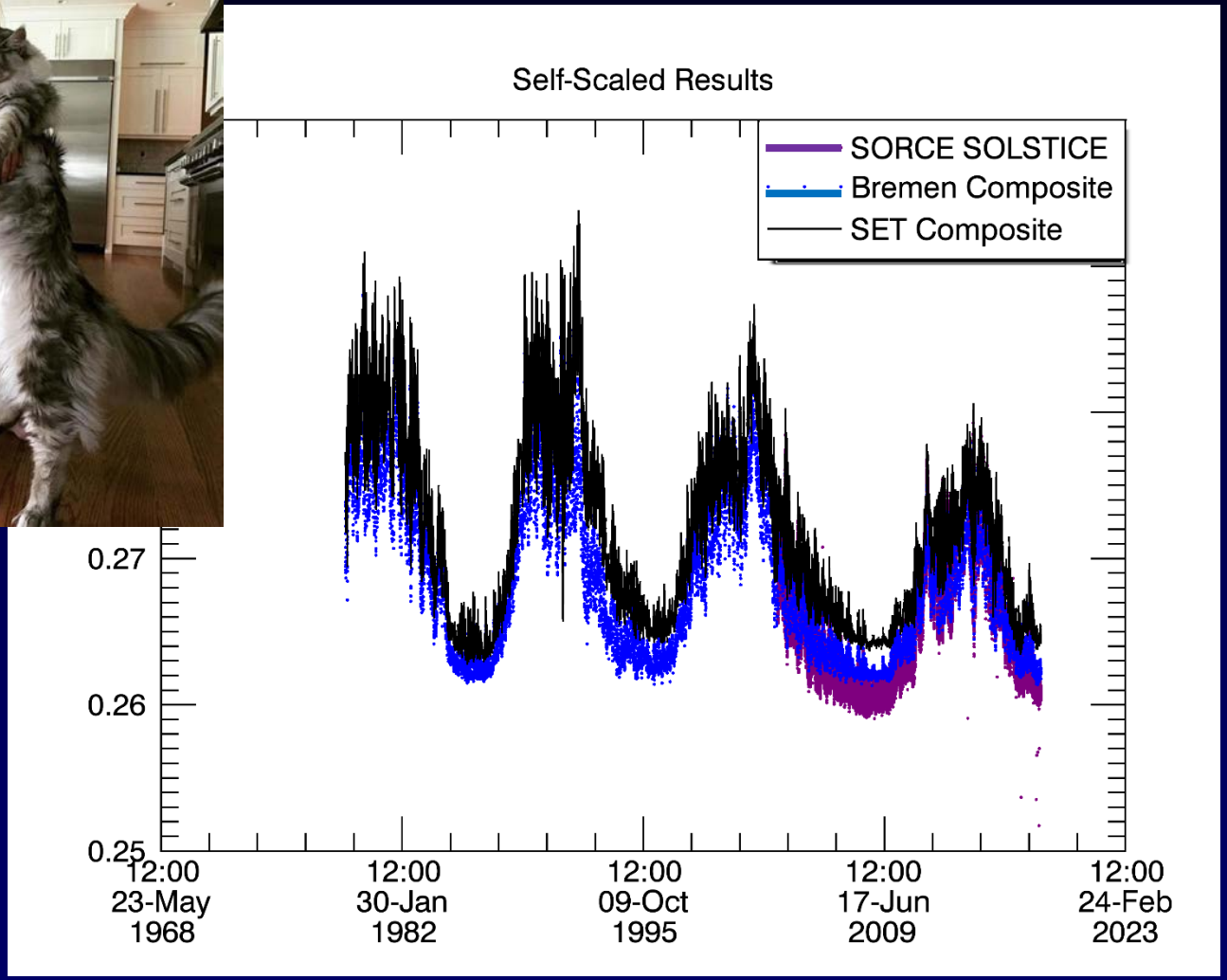
Native-to-Classic





Might not be GOME-2A,
This is scaled to Bremen Comp.

Preliminary Result



To Do during NCE

- Compute self-scaling for all available datasets
  - OLS vs ODR
- Resolve outliers like GOME-2B
- Assemble composite
  - Assess uncertainties
  - Validate proxy
- Publish