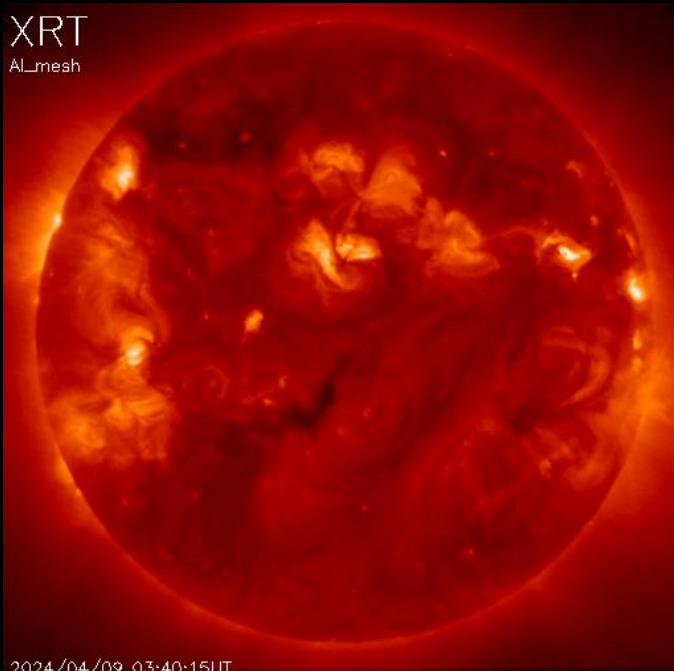


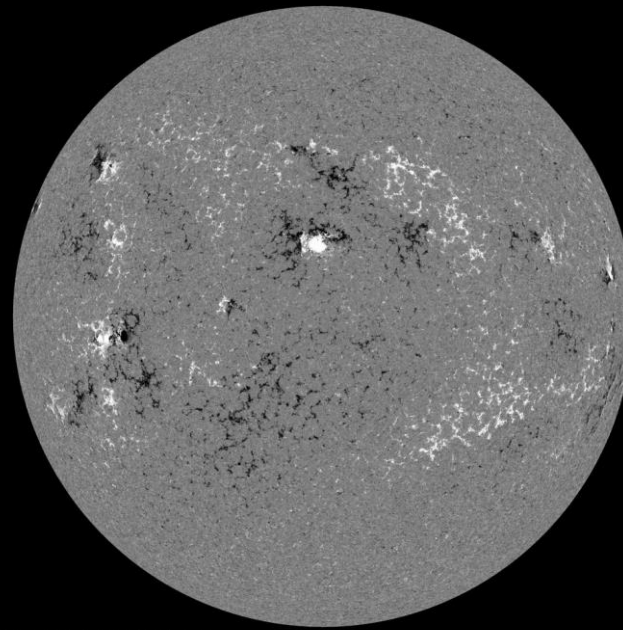
Comparing the Soft X-ray Irradiance from the Corona and the Magnetic Flux on the Sun's Surface

Kelvin Scheurer

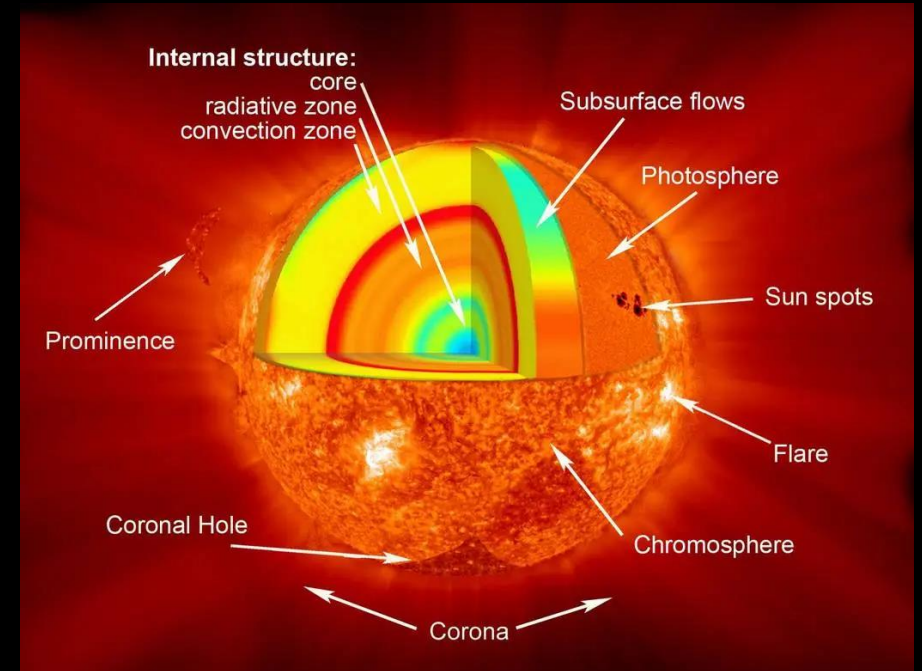
Mentor Dr. Keiji Yoshimura



Soft X-ray image
Hinode/XRT



Magnetogram
SDO/HMI



[Image from NASA article](#)

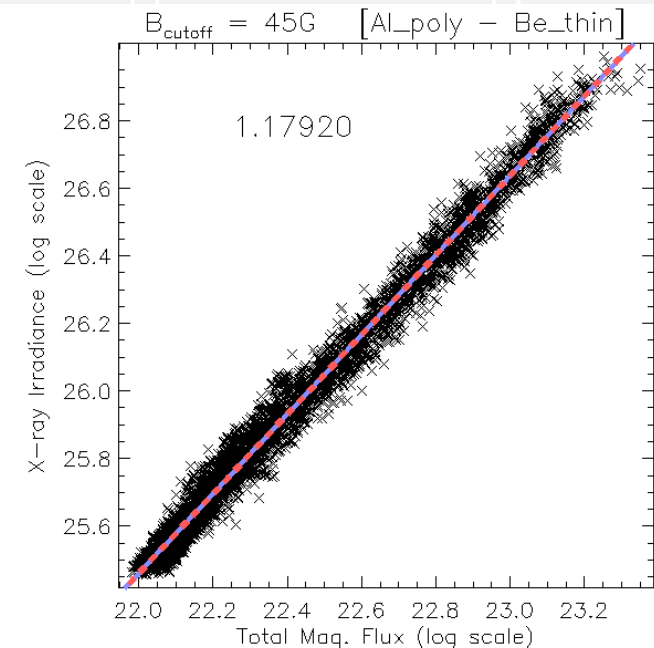
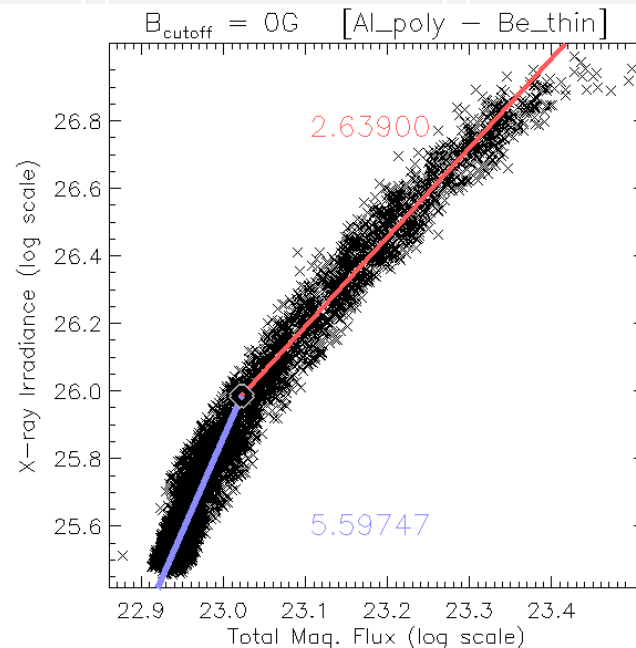
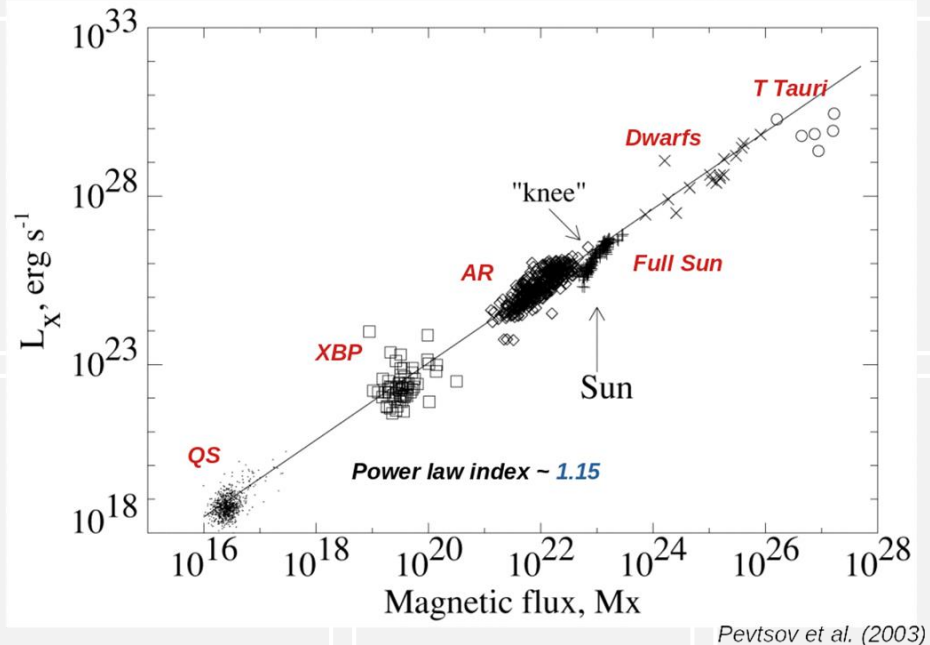
Project Motivation

- Surface of Sun approximately (6,000K)
- Corona > 1,000,000K
- Find characteristics of unknown heating mechanisms
- Use XRT (X-ray telescope) aboard the HINODE space telescope to observe the corona
- Use HMI (Helioseismic and Magnetic Imager) aboard SDO (Solar Dynamics Observatory) to observe magnetic fields
- Pevtsov et al (2003) showed relationship between X-ray luminosity and magnetic flux, leads into previous work

Previous Work Yoshimura et al (2024)

- Reproducing the knee structure
- Used Hinode/XRT and SDO/HMI data
- Results show reproduction of knee is dependent on parameters chosen

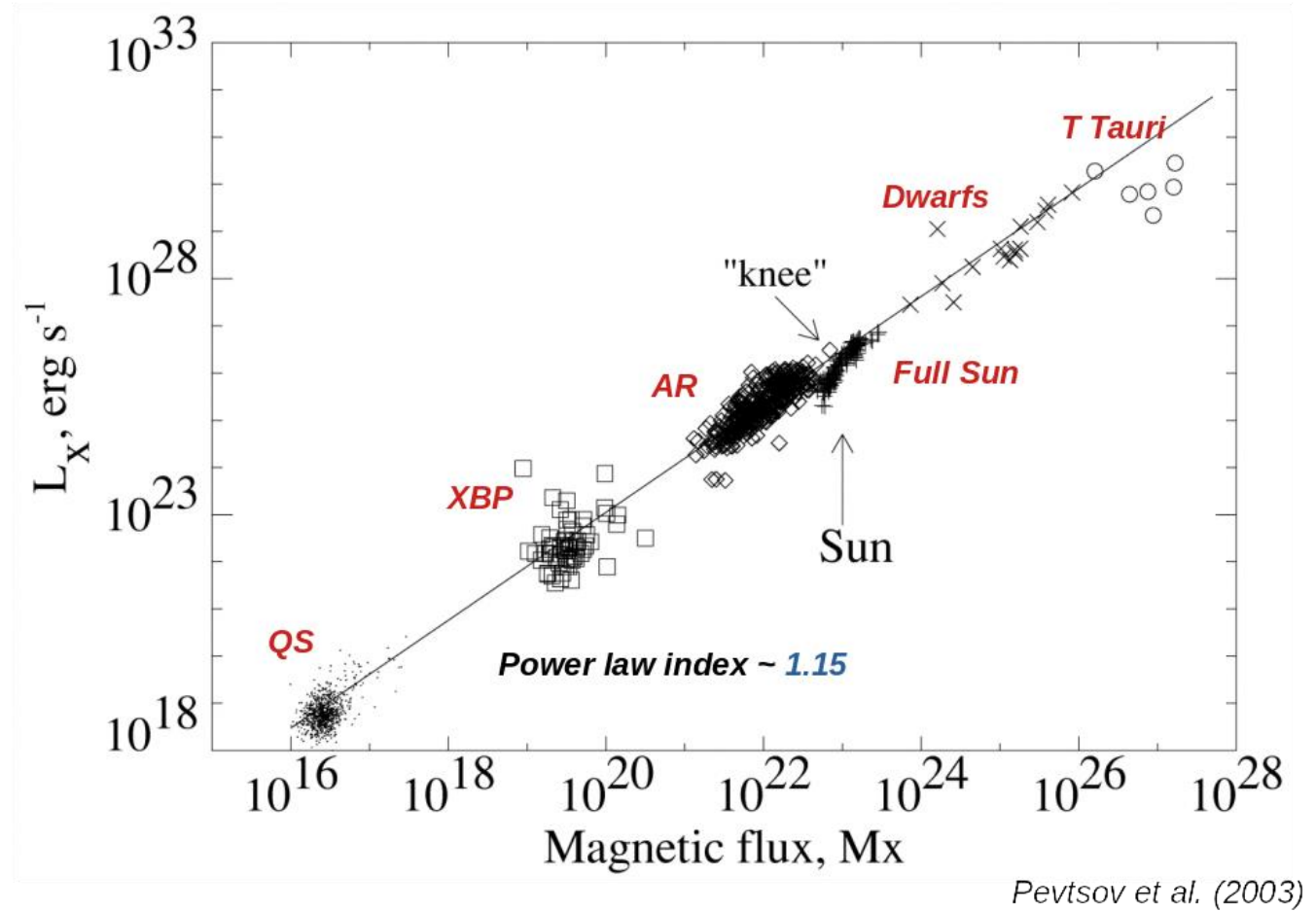
Relationship between X-ray luminosity and magnetic flux



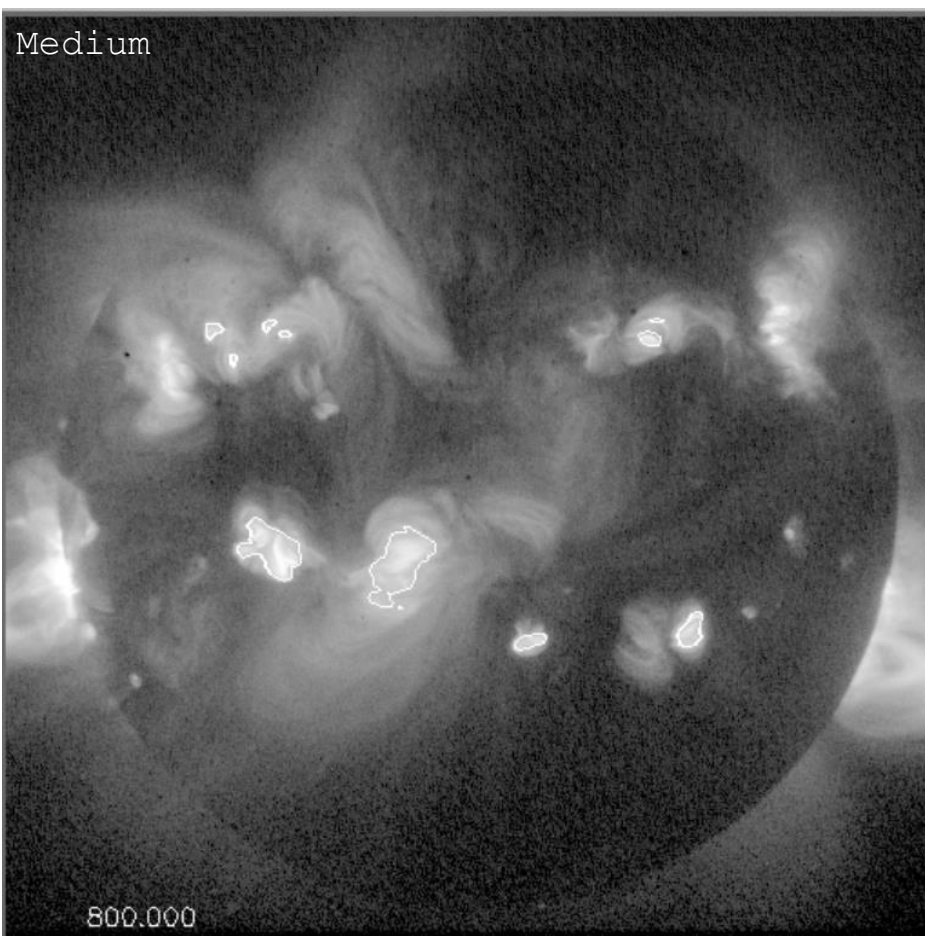
Project Objective

- Goal of REU project
- Expand data regions to check parameter dependency
- Plot between XBP (X-ray bright points) and AR (active region)

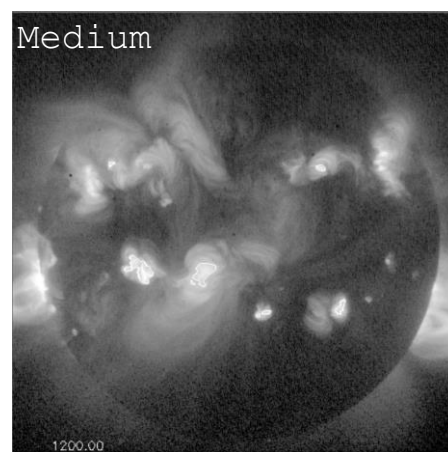
Relationship between X-ray luminosity and magnetic flux



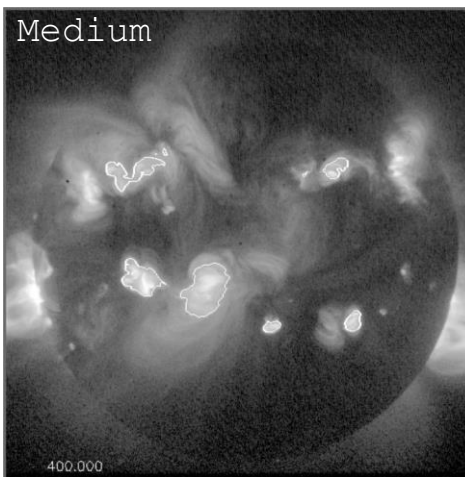
Medium



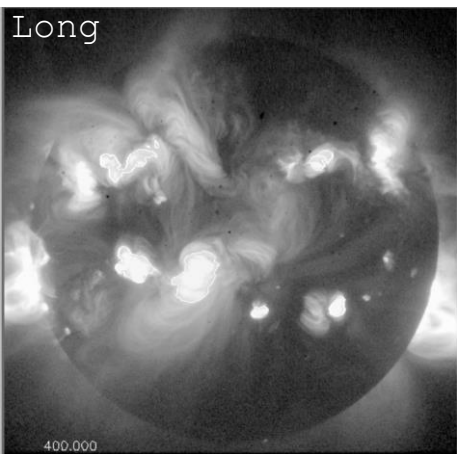
Medium



Medium



Long



Short

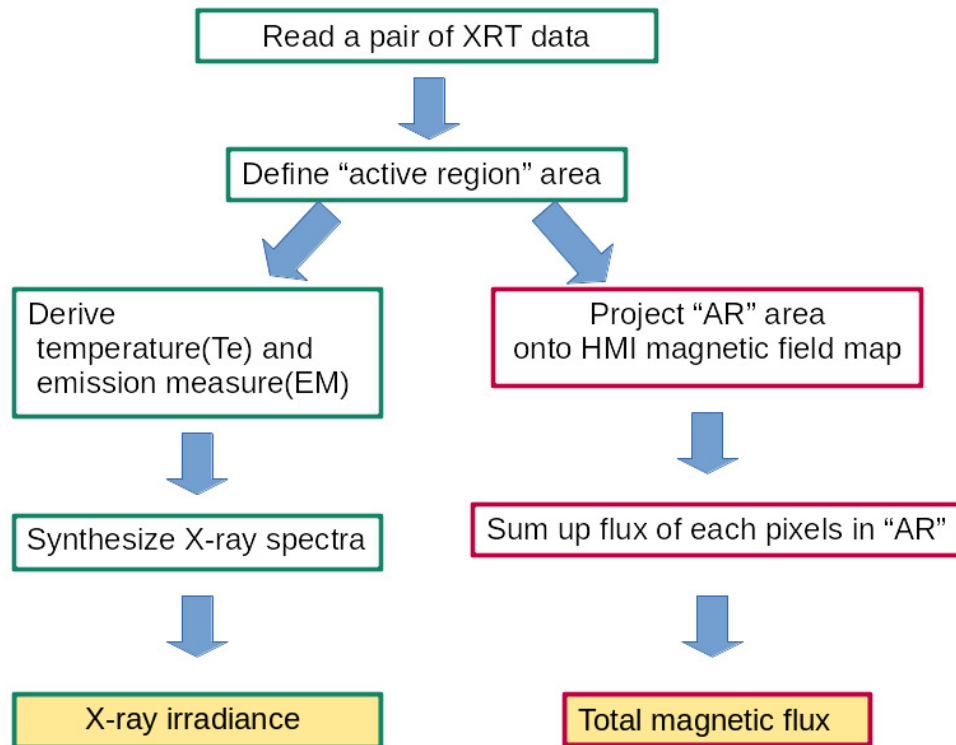


Current Progress

- Learning IDL
- Made images highlighting AR of the sun using Hinode/XRT data
- Images taken May 16th, 2024
- Testing different thresholds for highlighting AR (within 0.8 solar radii)
- Looking at different exposure lengths; short (0.005108 s), medium (0.128016 s), long (0.725504 s)

Next steps

- Project "AR" area onto HMI magnetic field map



Questions?