The Sensitivity of AIA Observations to Coronal Heating Parameters

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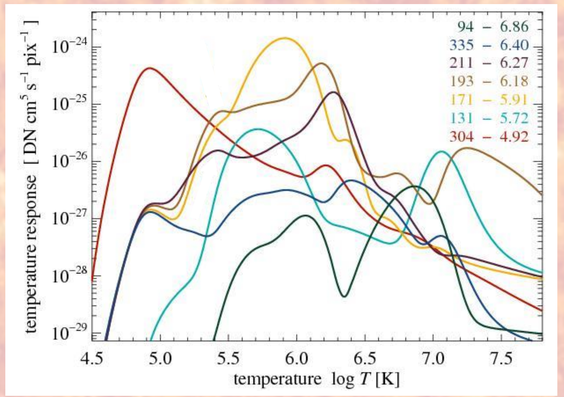
Introduction

- The magnetically closed **corona** has **temperatures > 10^6 K**
  - Caused by conversion of **magnetic energy** into plasma thermal energy
  - The specific **heating mechanism** is still **undetermined**
- One way to study this heating is by modeling extreme ultraviolet (**EUV**) emission from **active regions**
  - Each heating parameterization produces a **unique emission signature**
- Many **studies struggle** to simultaneously match the morphology and amplitude of **coronal** emission **across multiple channels**
  - We investigate **transition region emission** in Atmospheric Imaging Assembly (**AIA**) data to explain this

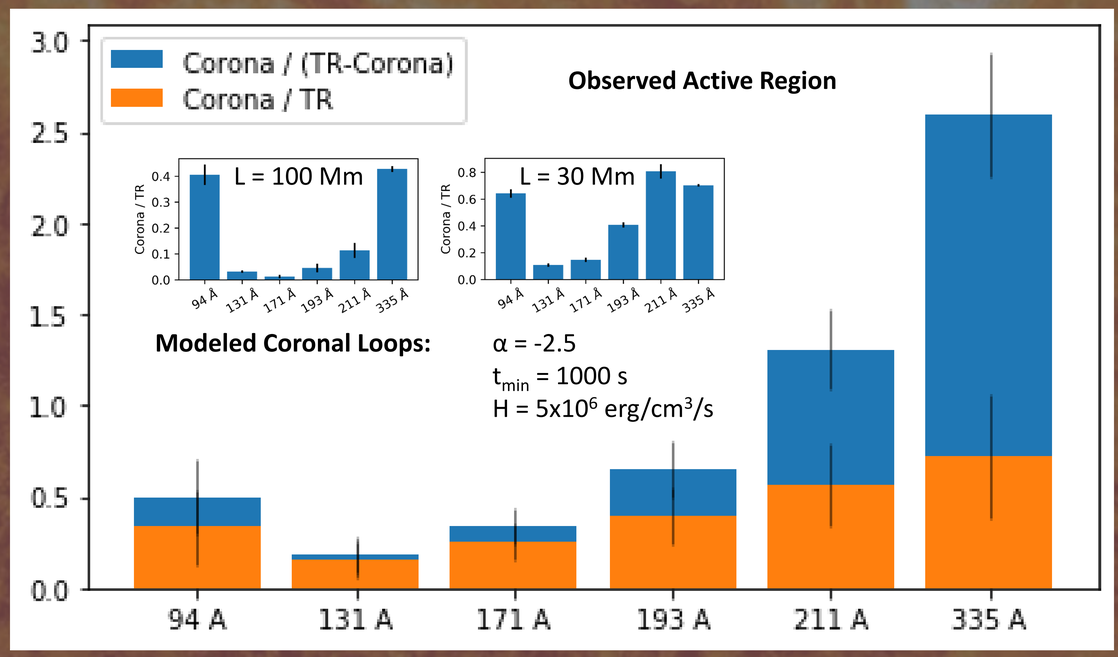


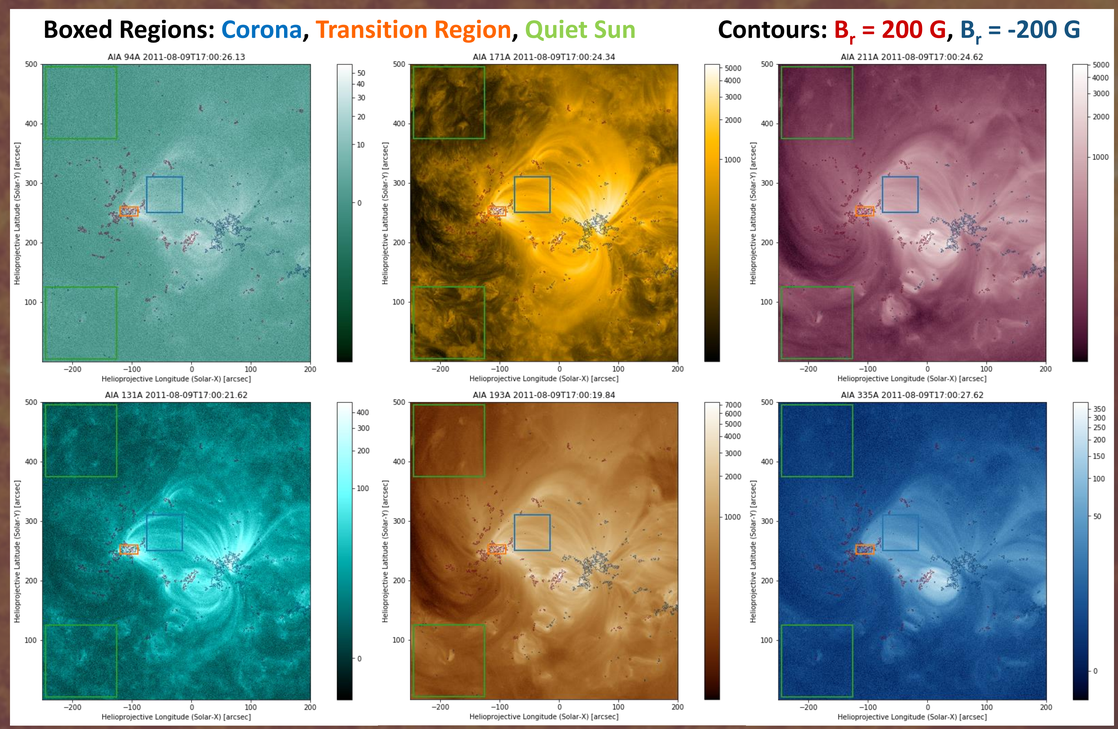
AIA Temperature Response Functions
Peter, Bingert, and Kamio 2010

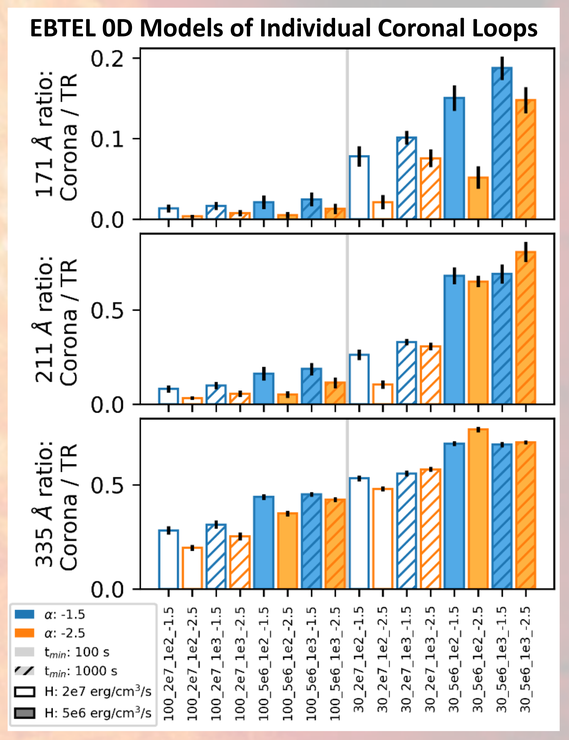
Methodology

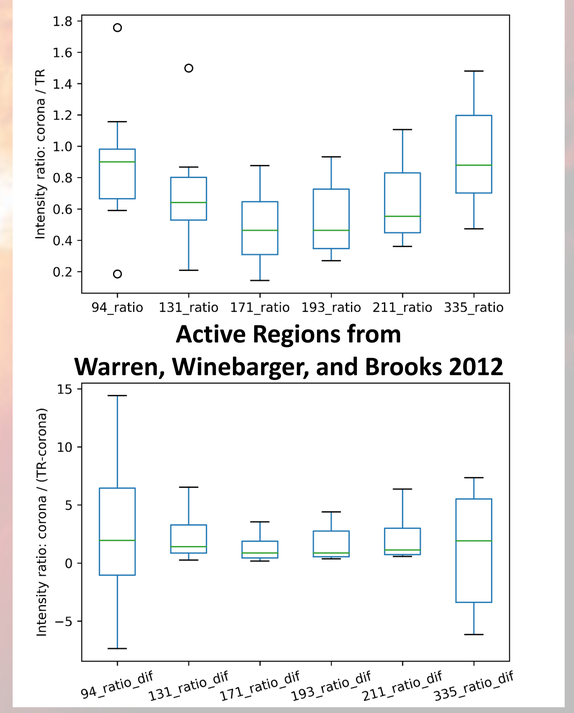
- We identify features in active regions observed by AIA:
  - **Corona**: Distinct loops connecting two regions of opposite magnetic polarity with weak underlying magnetic fields
  - **Transition Region**: Termination of loops in strong ($|B_r| > 200$ G) photospheric fields
- **Compare** the ratio between **observed intensities** in these regions with **EBTEL 0D models** of active region loops

Active region models must include the **transition region** to accurately represent **EUV emission.**









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