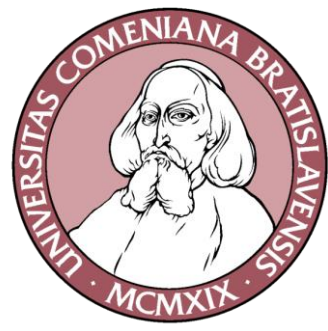


Non-Maxwellian diagnostics of a coronal loop observed by SDO/AIA and Hinode/EIS



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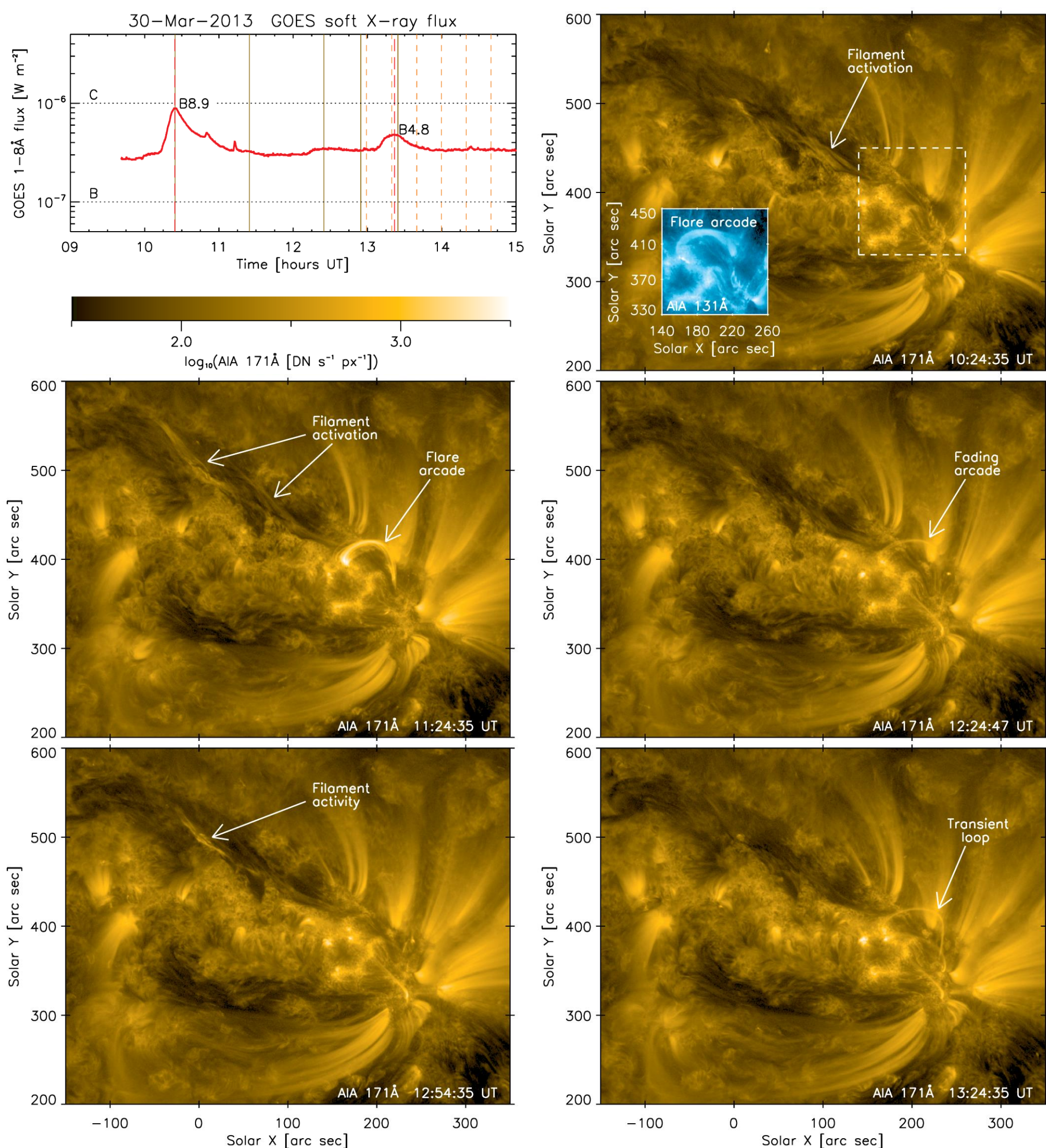
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1. Introduction

- Solar corona cannot be probed directly – we only have its spectrum
- Particle acceleration can lead to departures from the Maxwellian
- Non-Maxwellian distributions will strongly influence the emitted spectrum**
- We report on observations of a non-Maxwellian coronal loop**
- New atomic data corresponding to CHIANTI 8 are used for the analysis

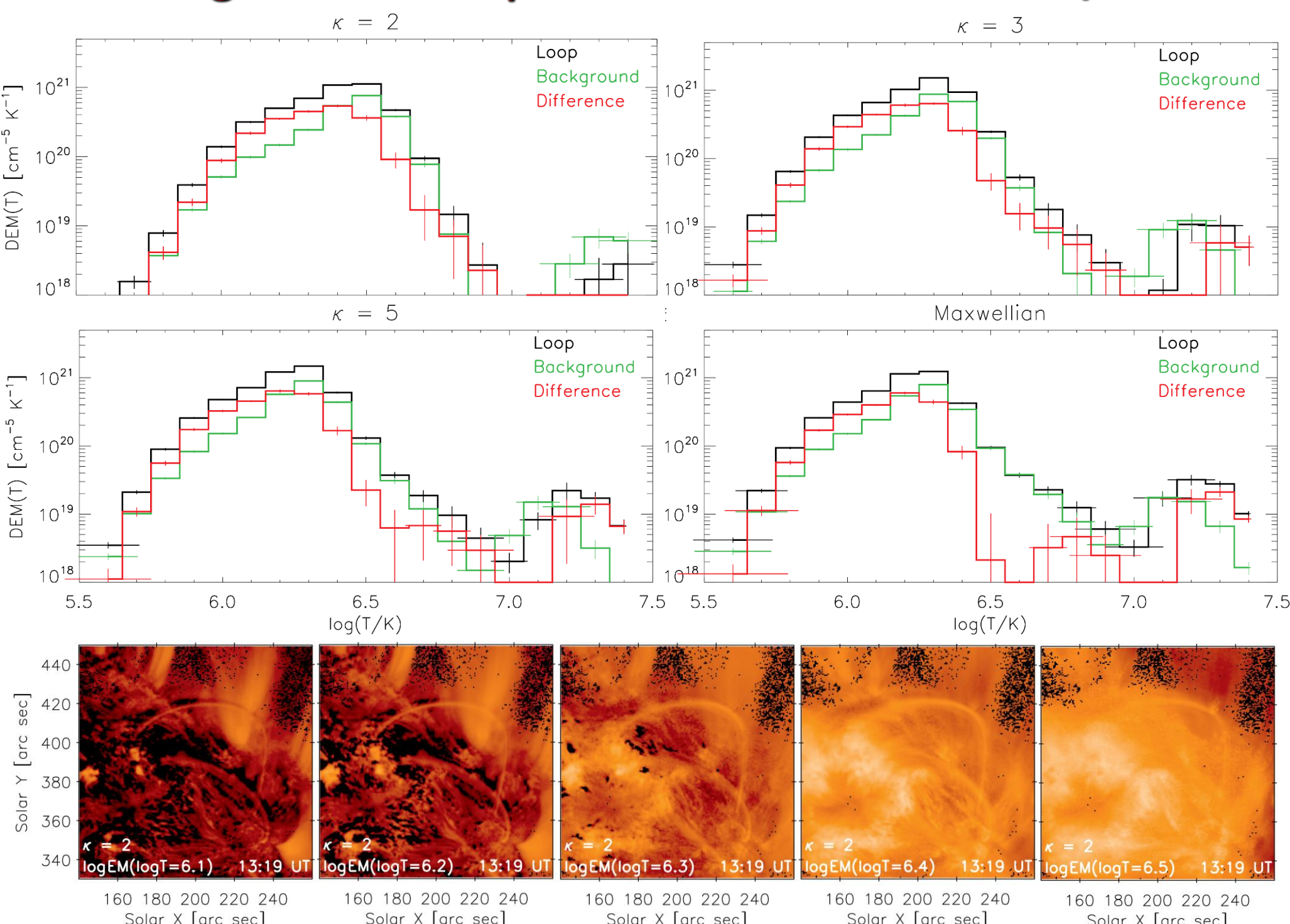
2. B8.9 microflare followed by the transient loop



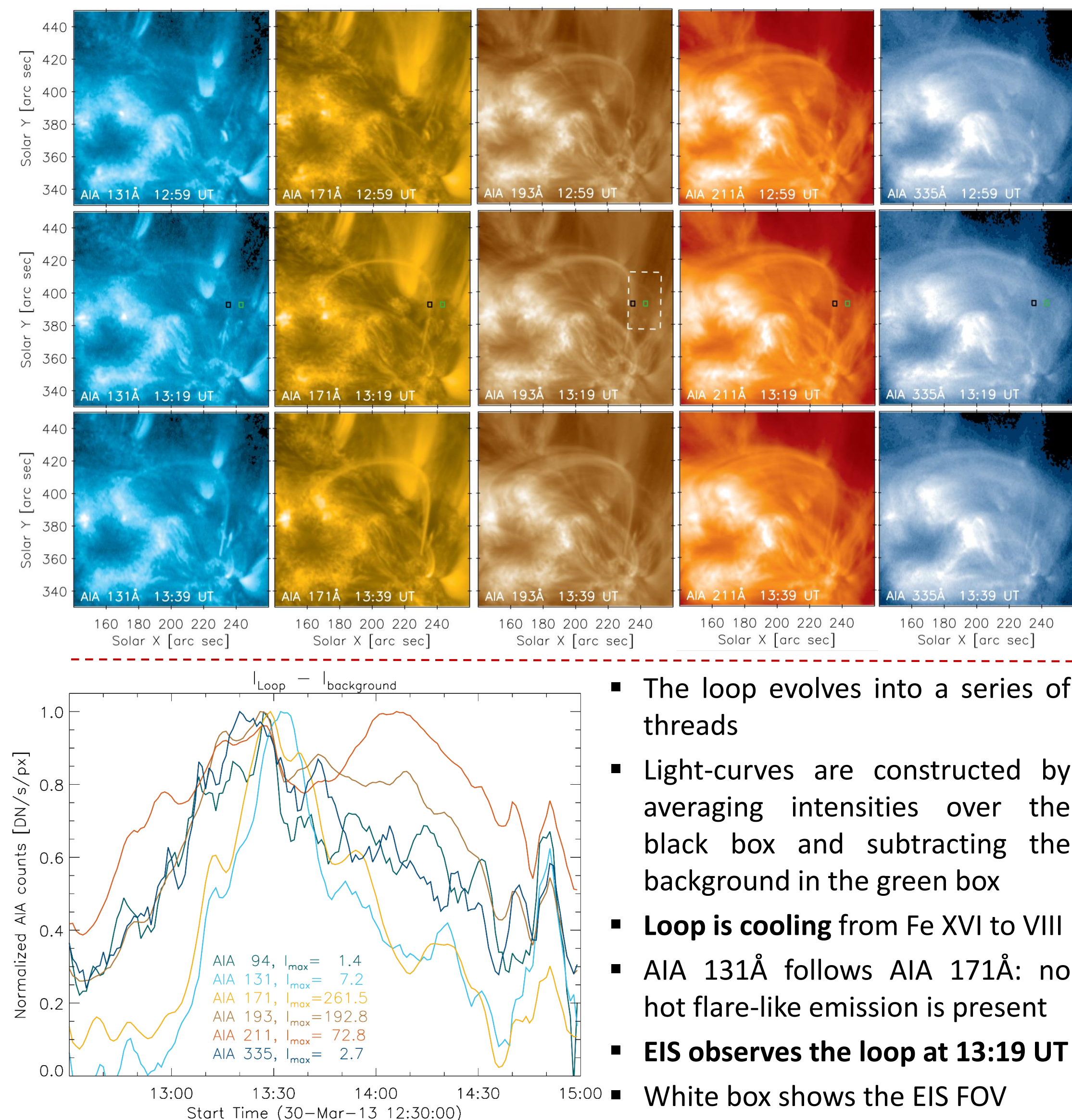
Observed evolution:

- Failed filament eruption followed by a B8.9 microflare in AR core
- The flare arcade cools down and disappears
- Transient loop reappears in the same place within AR core**
- This happens during another B4.8 microflare in an unrelated AR
- Loop evolves into a series of threads and is multithermal for all κ
- The appearance of the loop may indicate ongoing magnetic reconnection

4. Regularized Loop DEMs derived from SDO/AIA

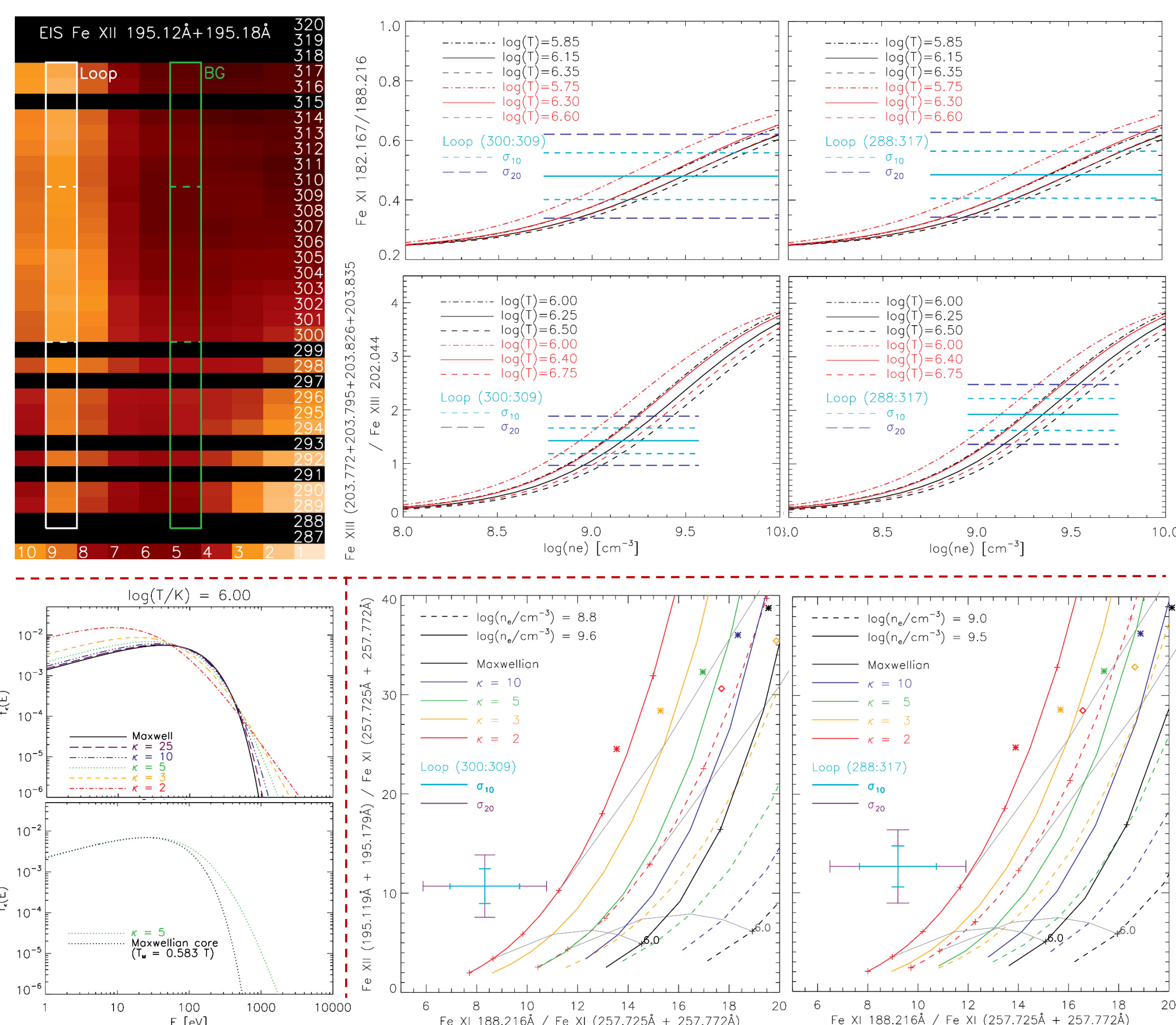


3. Multiwavelength observations from SDO/AIA



- The loop evolves into a series of threads
- Light-curves are constructed by averaging intensities over the black box and subtracting the background in the green box
- Loop is cooling from Fe XVI to VIII**
- AIA 131Å follows AIA 171Å: no hot flare-like emission is present**
- EIS observes the loop at 13:19 UT**
- White box shows the EIS FOV

5. Hinode/EIS raster observations and diagnostics of n_e and κ



Results:

$\log(n_e/\text{cm}^{-3}) = 8.8\text{--}9.6$ for 10-pixel loop segment, 9.0–9.5 for average loop spectrum

- The loop is highly non-Maxwellian, with $\kappa < 2$**
- Calibration uncertainty is large (20%) and ought to be reduced in future missions.

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