

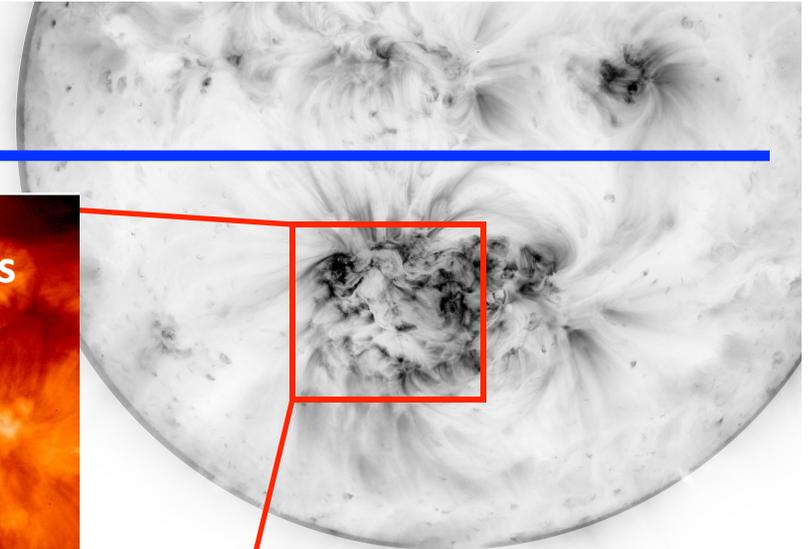
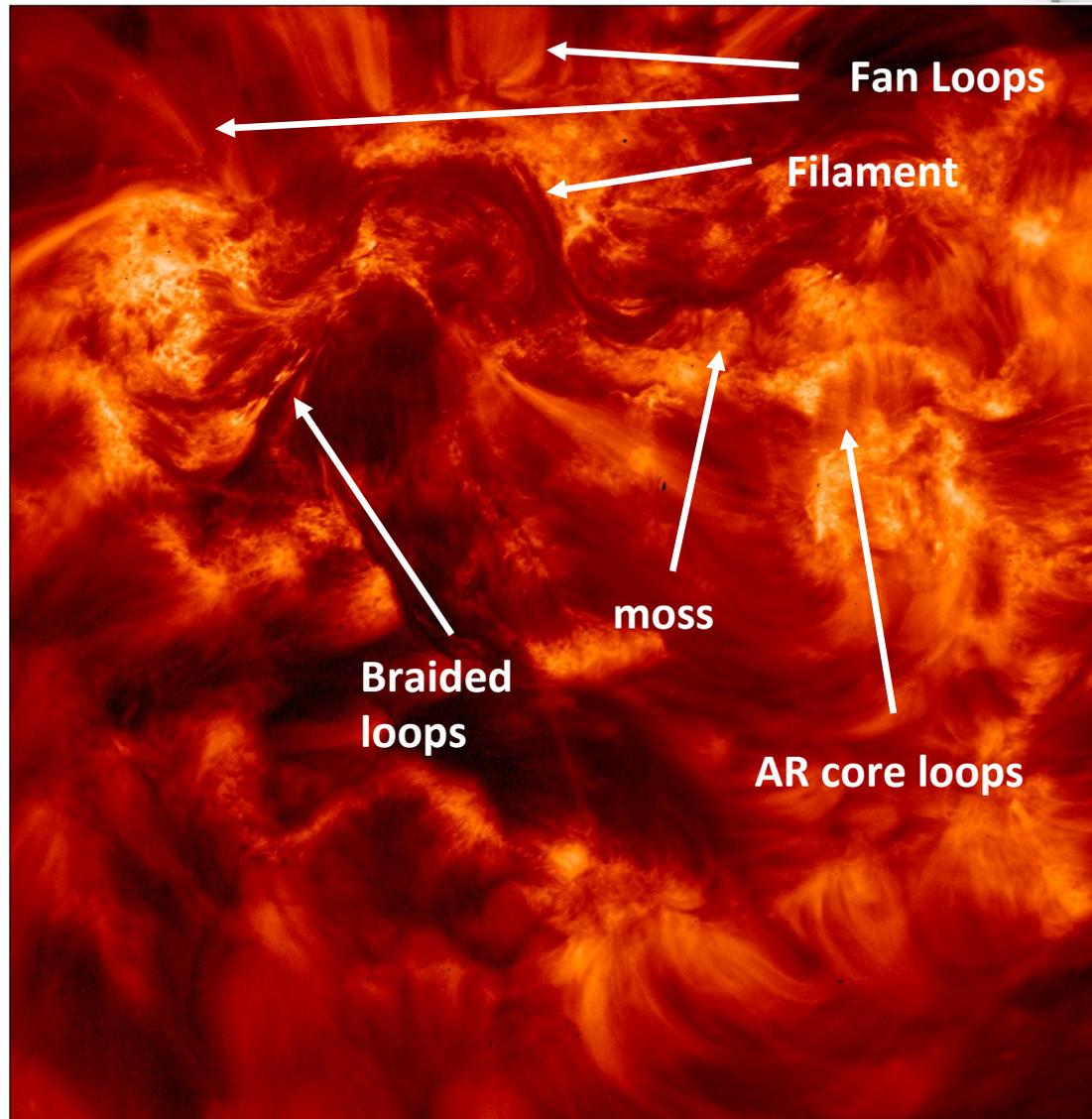
Anti-parallel filament flows and bright dots observed in the EUV with Hi-C

Caroline E. Alexander¹, Stéphane Régnier²,
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& the Hi-C Science Team

¹NASA Marshall Space Flight Center, Huntsville, AL, USA

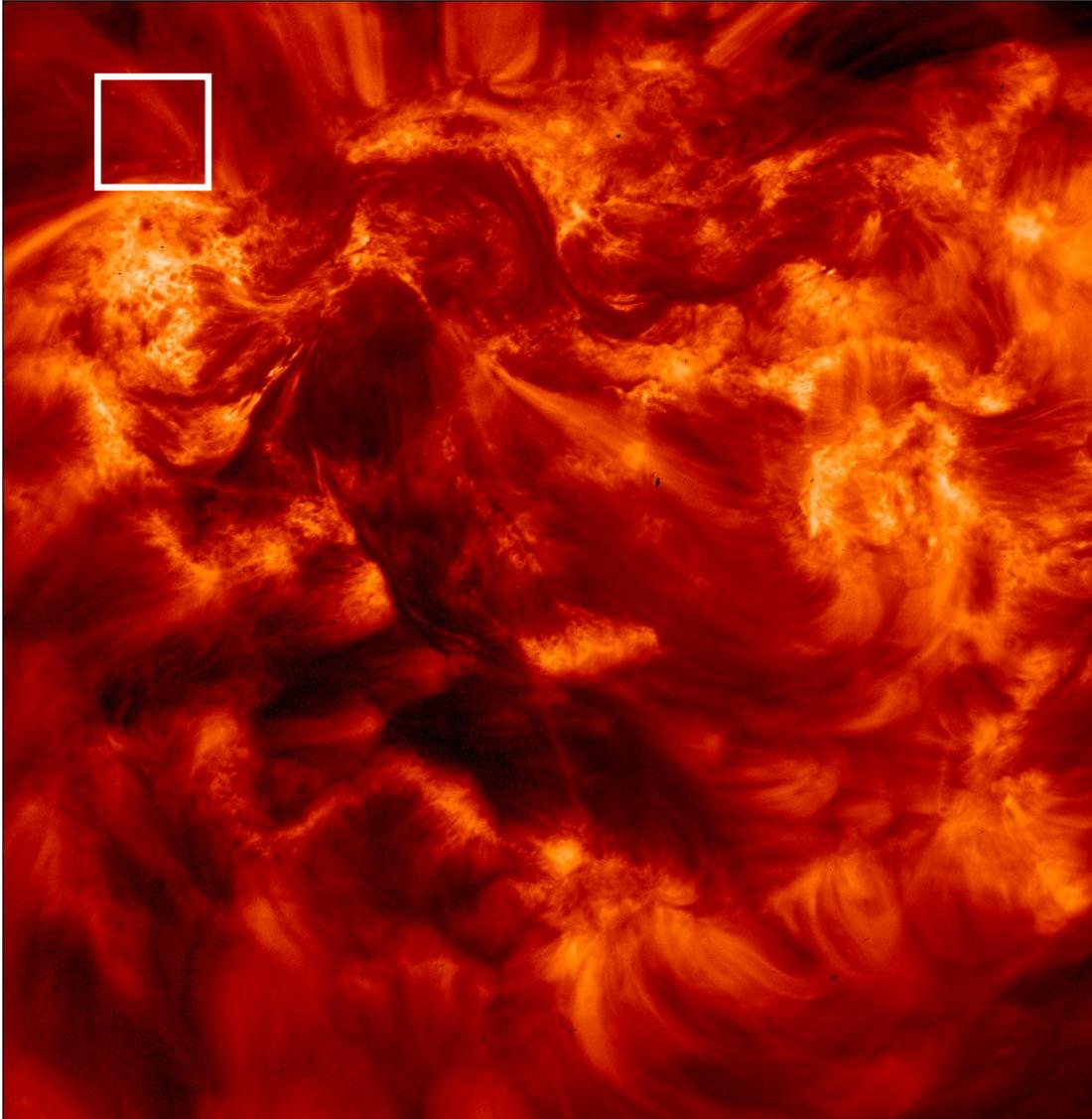
²Jeremiah Horrocks Institute, University of Central Lancashire, UK

Hi-C Regions of interest

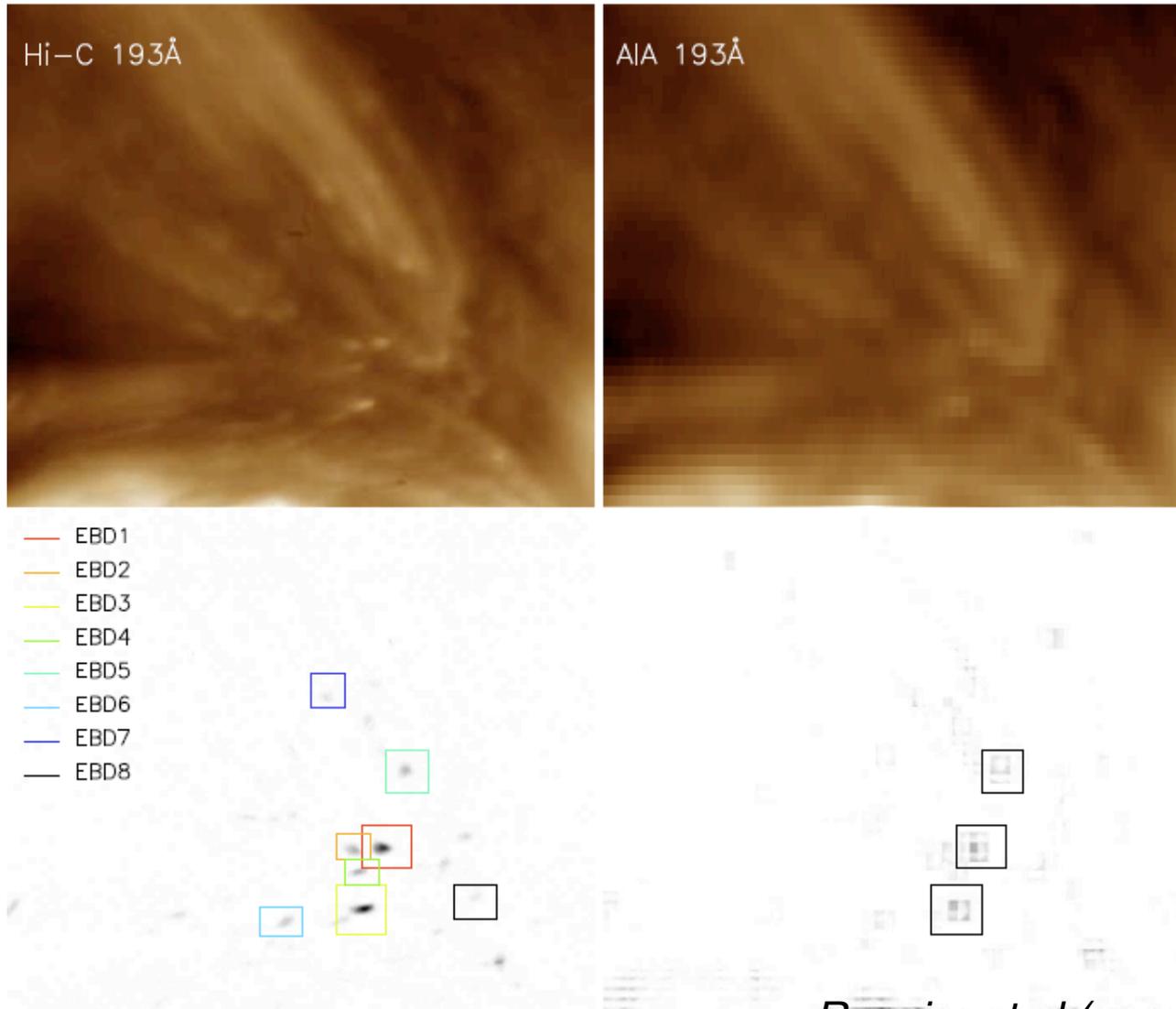


The Hi-C target was Active
Region 11520
11 July 2012 18:55 UT

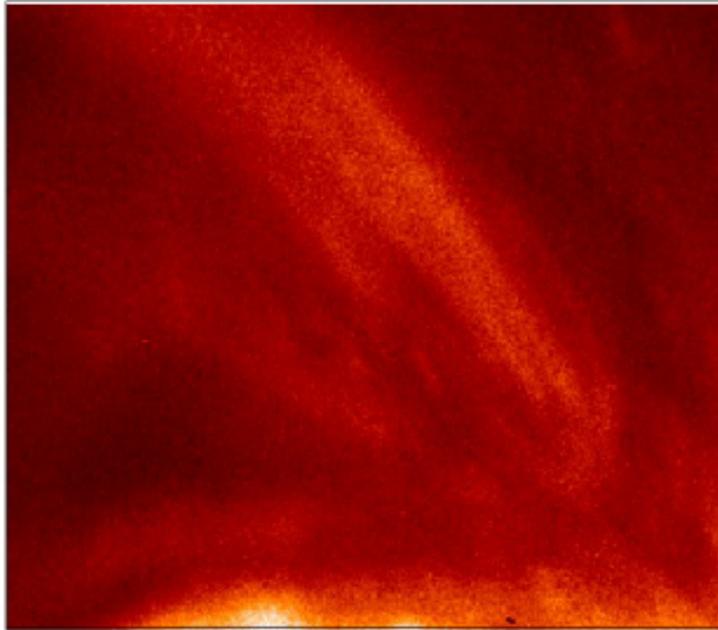
1. EUV Bright Dots



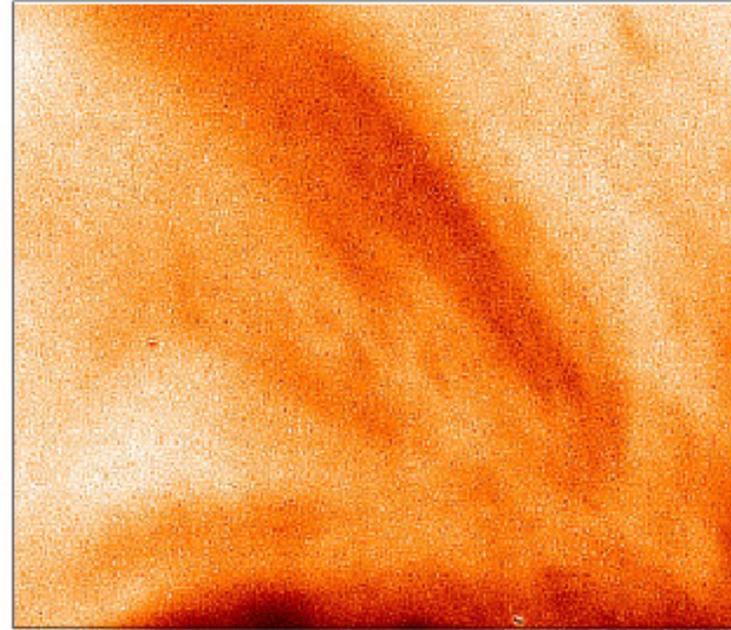
1. EUV Bright Dots



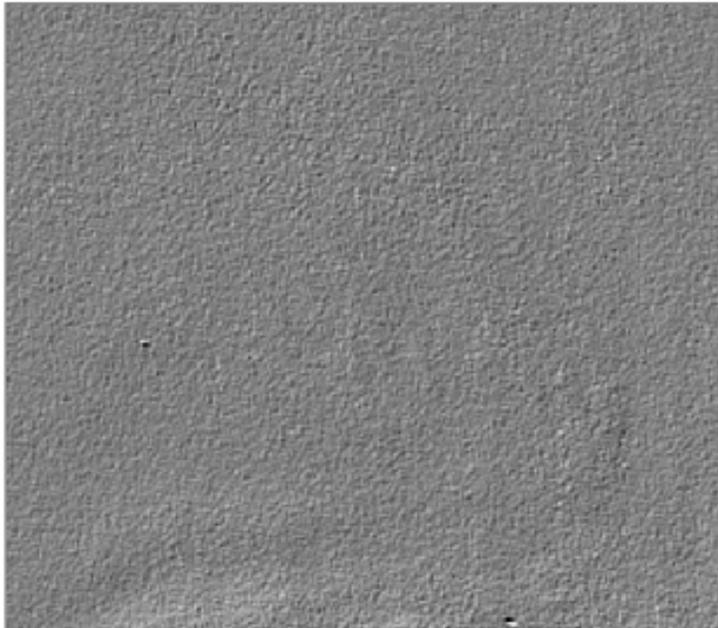
Hi-C: 18:52:09 UT



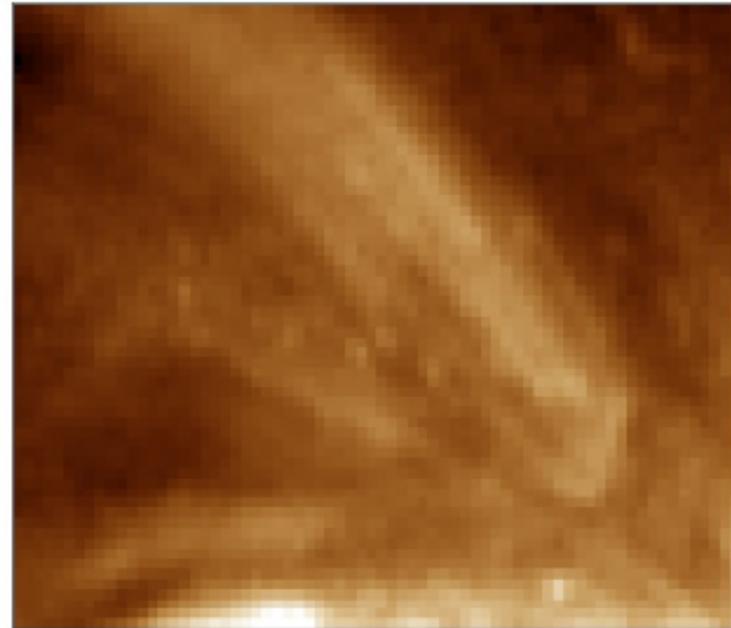
Hi-C filter



Hi-C edge

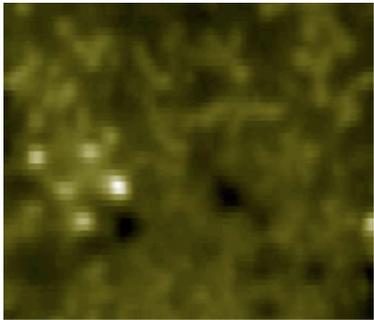


AIA 193



1. EUV Bright Dots

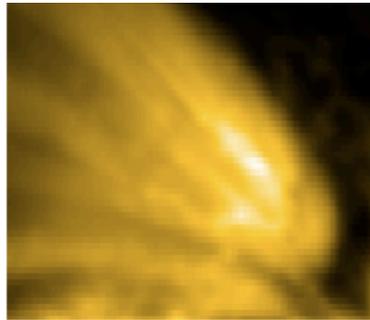
1600Å



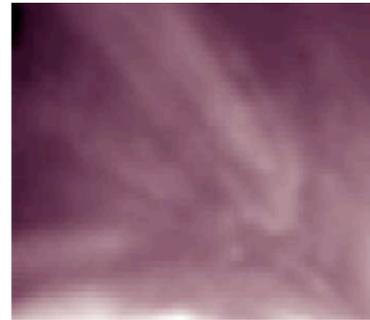
304Å



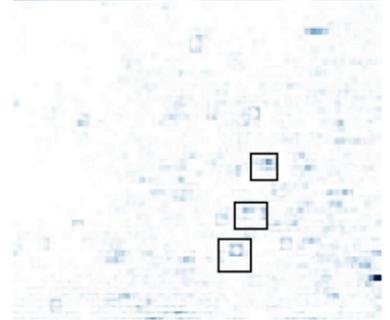
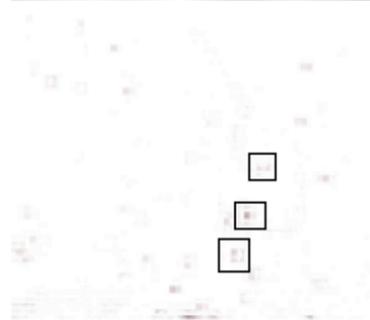
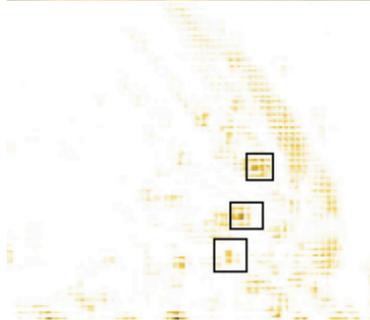
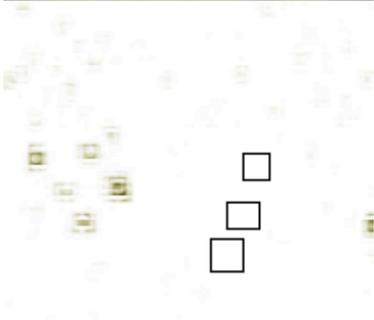
171Å



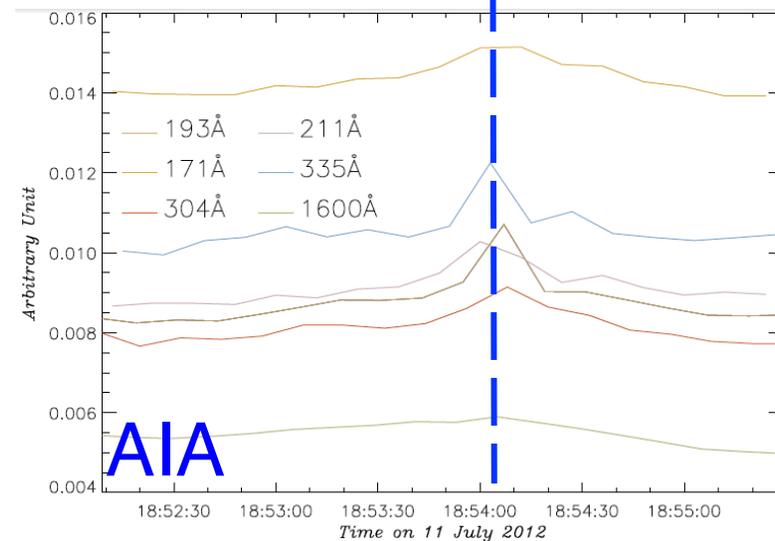
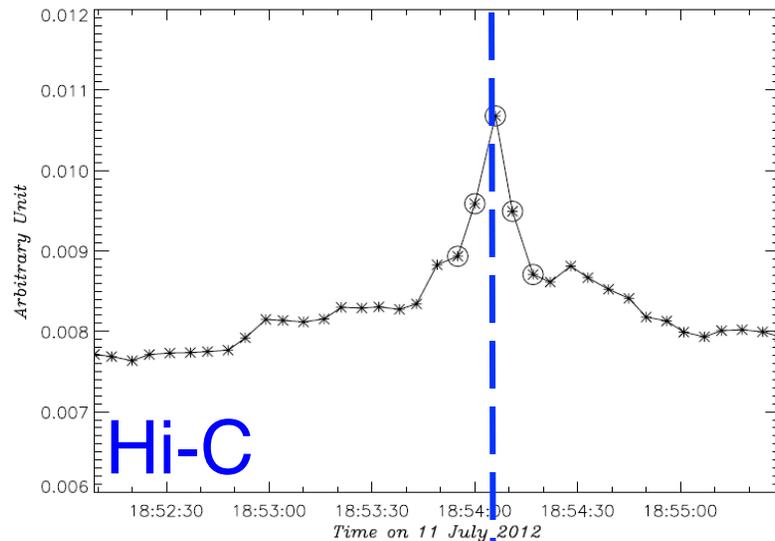
211Å



335Å

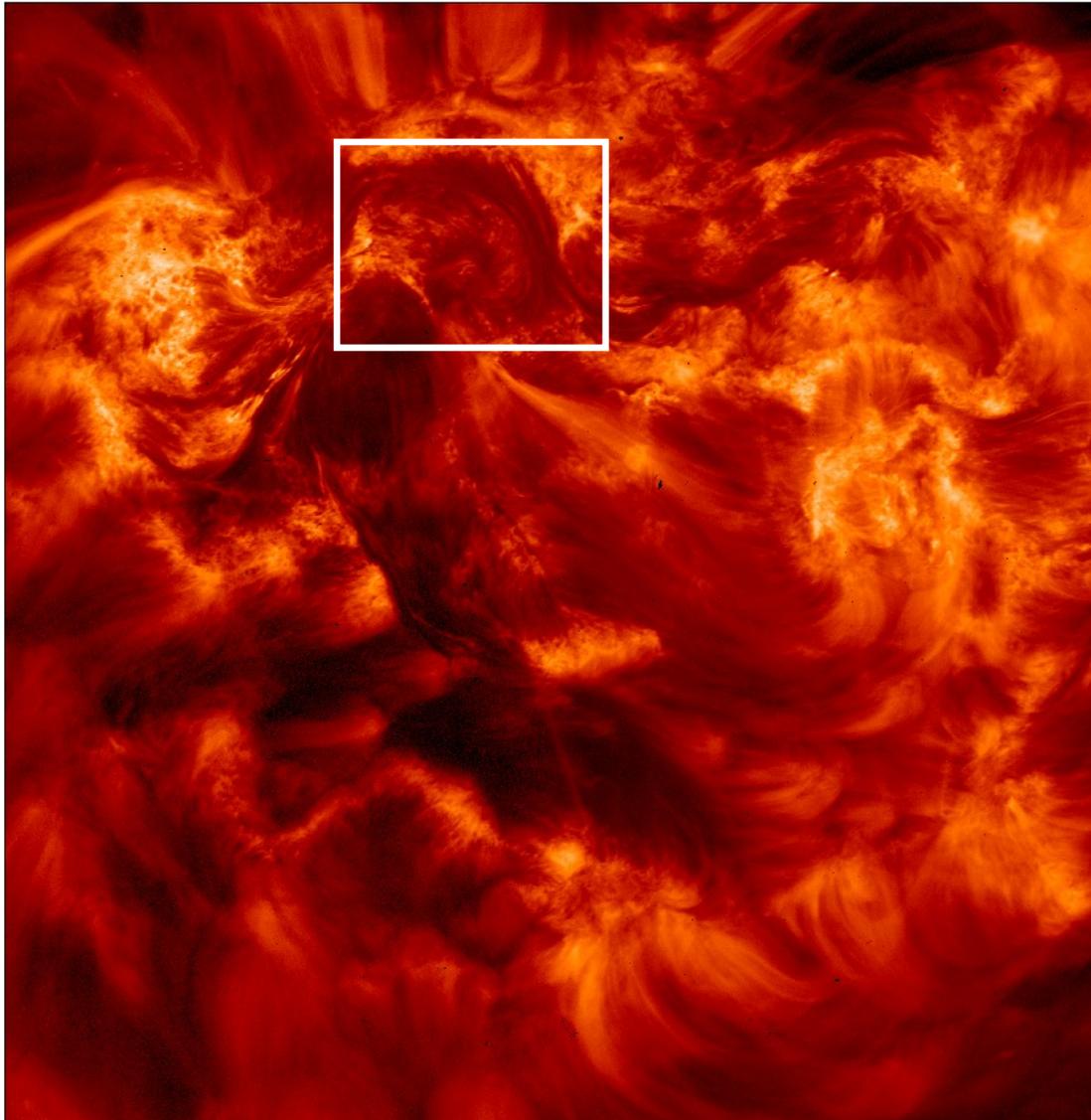


1. EUV Bright Dots

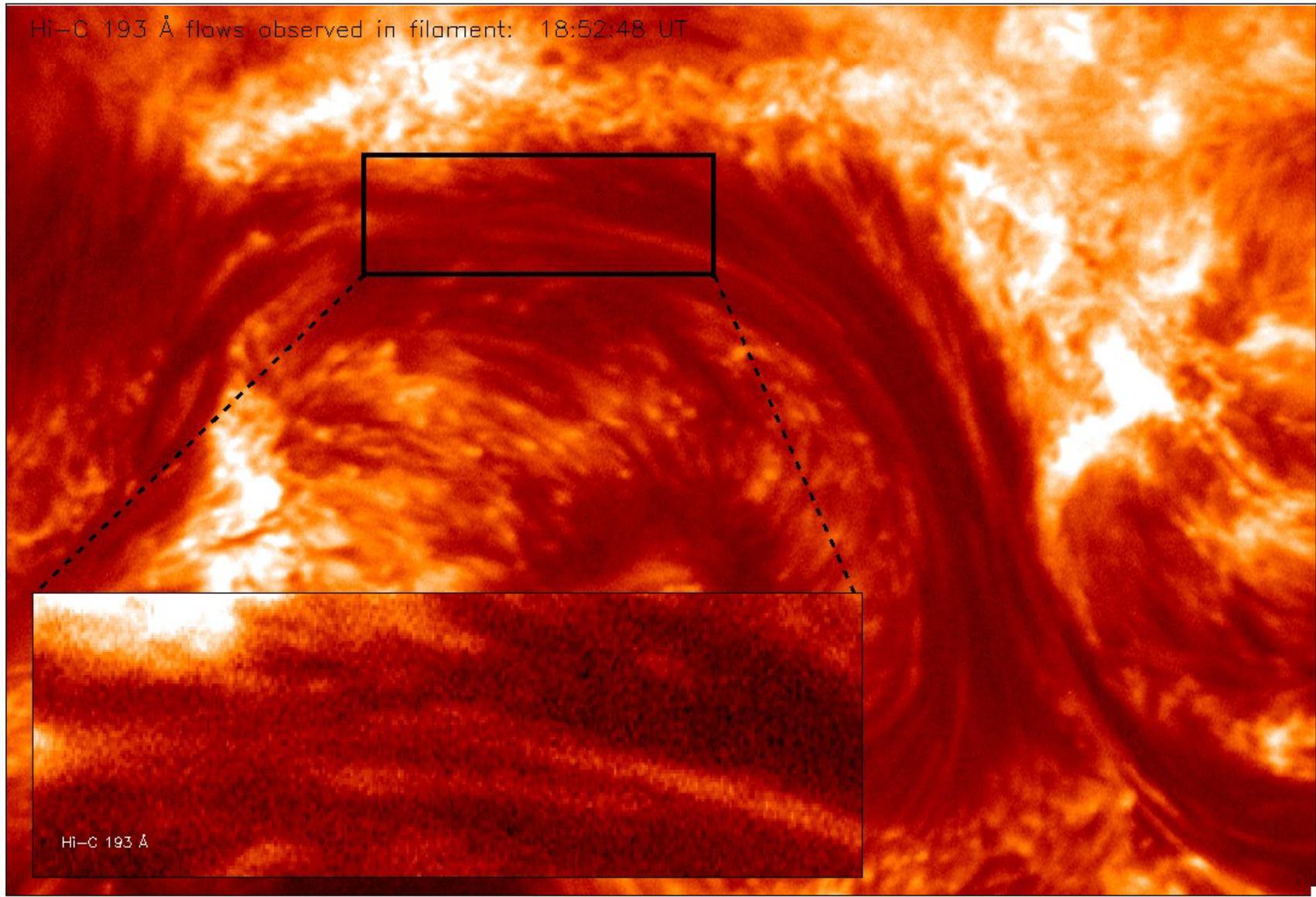


- Dots generally appear in only one AIA image, but several Hi-C images.
- Characteristic duration of 25s
- Characteristic length of 680 km ($<1''$)
- Not fully spatially or temporally resolved in SDO/AIA

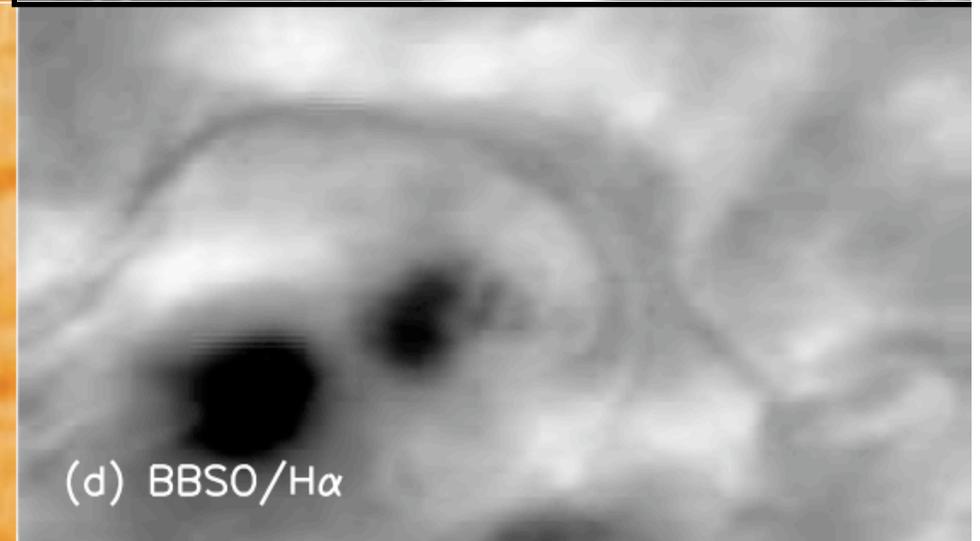
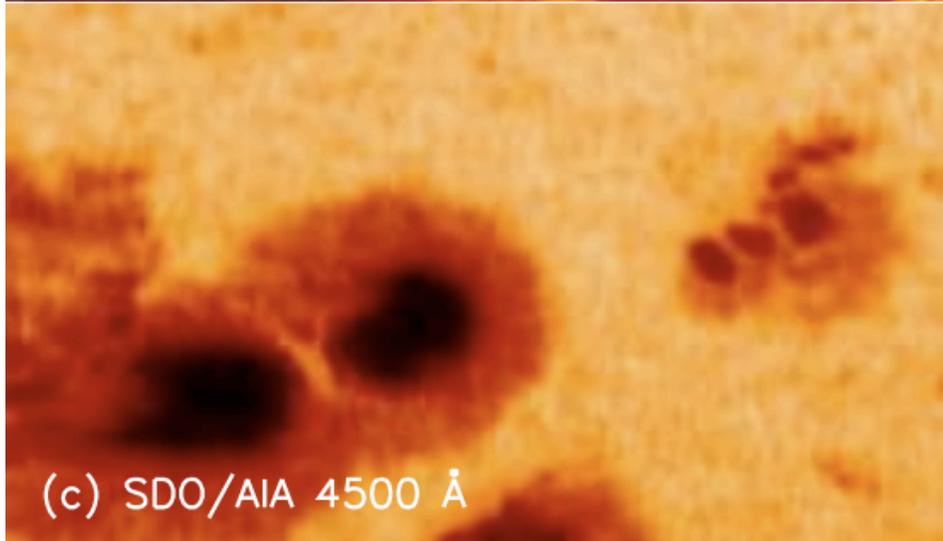
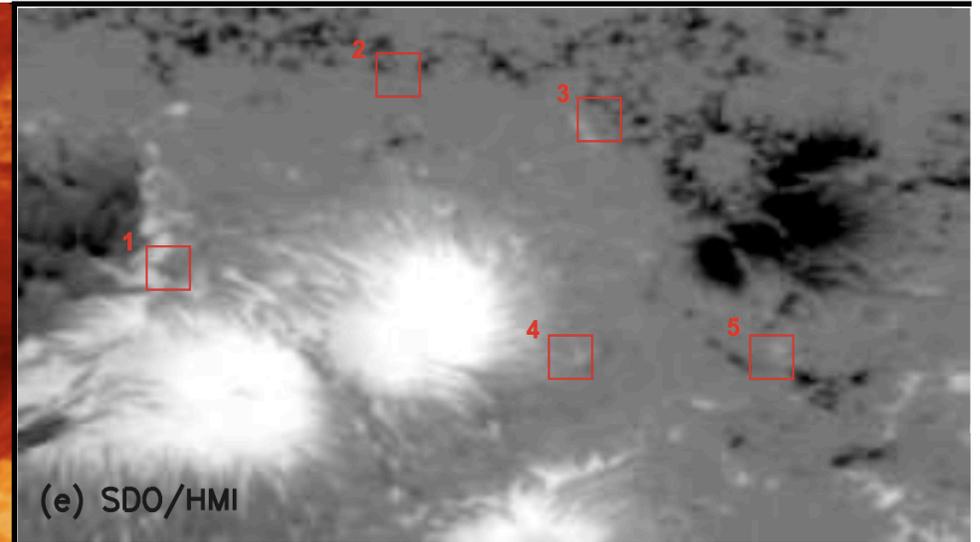
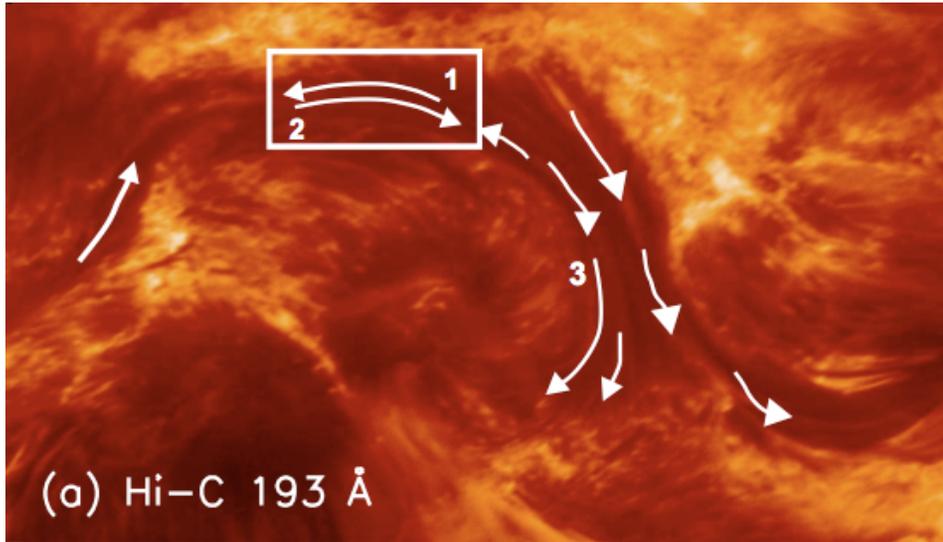
2. Counter-streaming flows



2. Counter-streaming flows

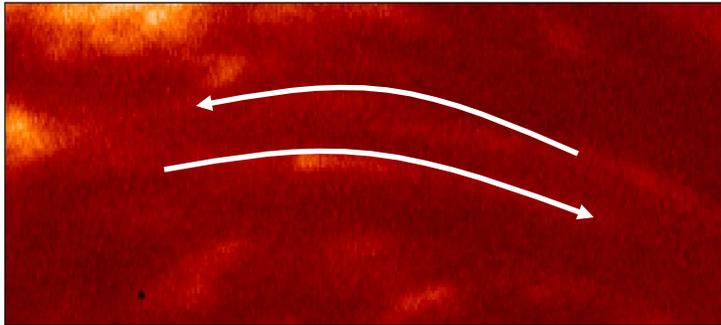


3. Counter-streaming flows

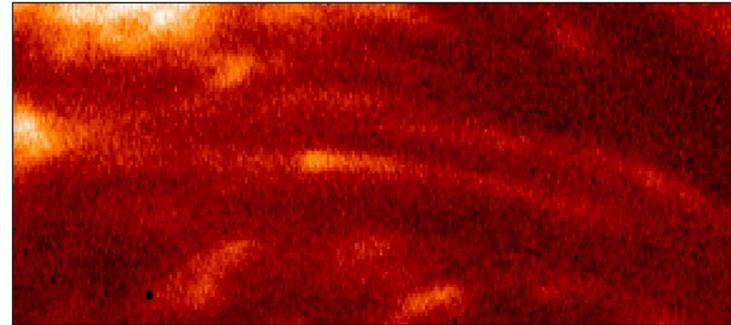


3. Counter-streaming flows

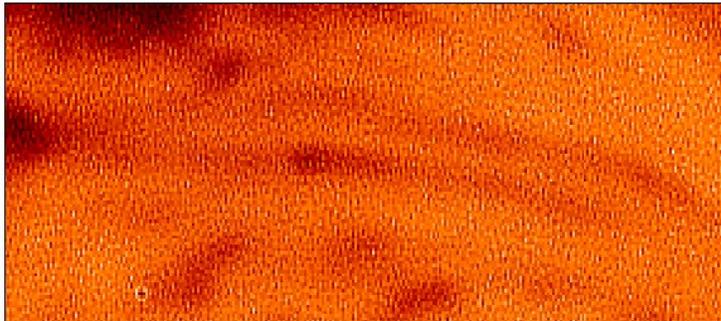
Hi-C: 18:53:43 UT



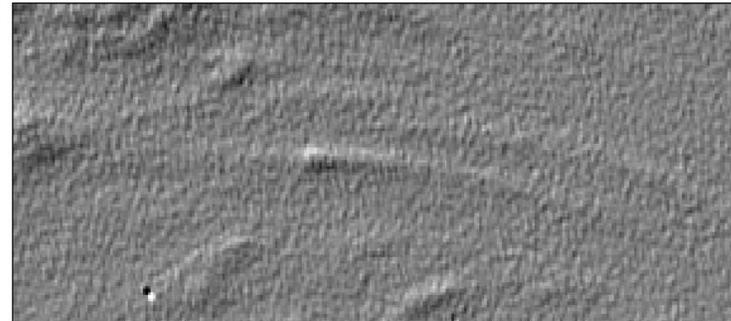
Hi-C log



Hi-C filter



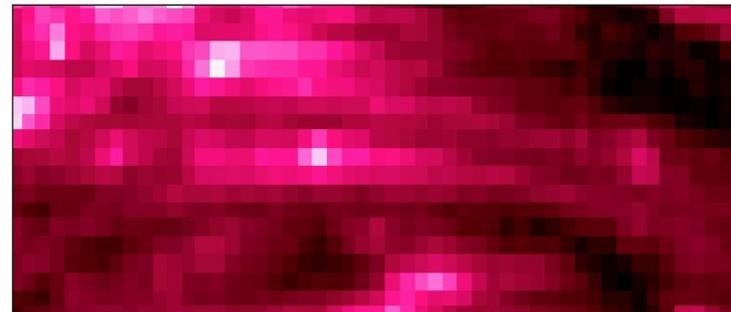
Hi-C edge



AIA 193

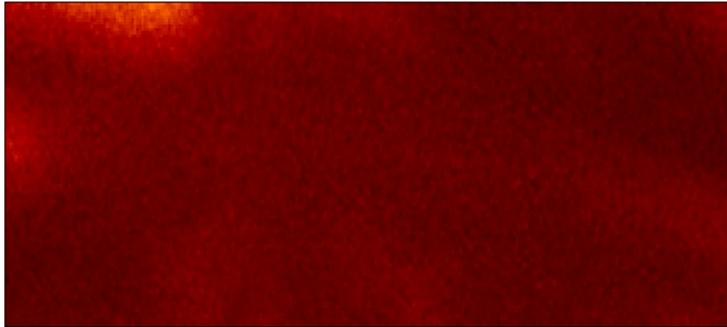


AIA 304

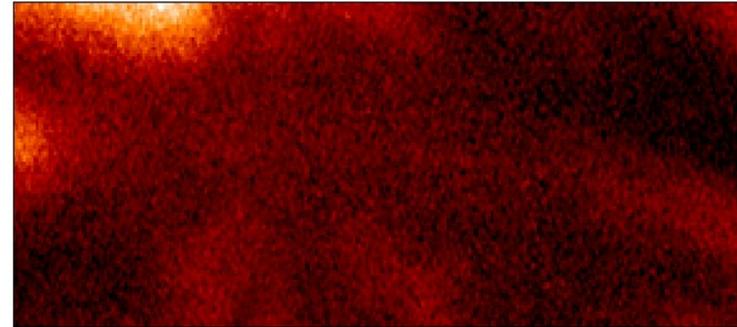


3. Counter-streaming flows

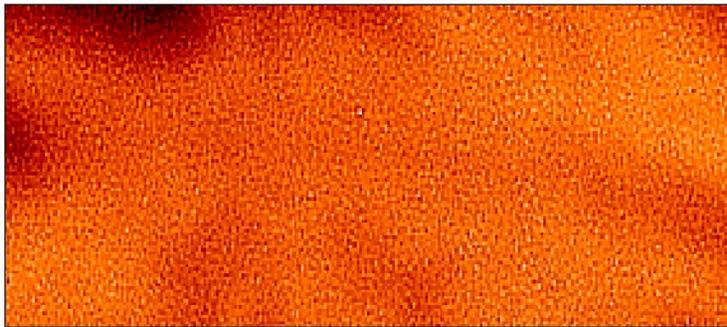
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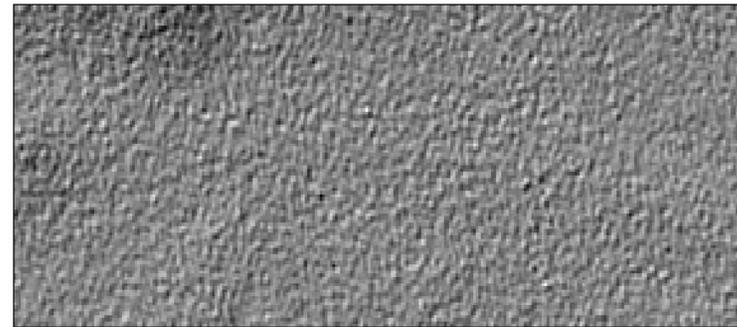
Hi-C log



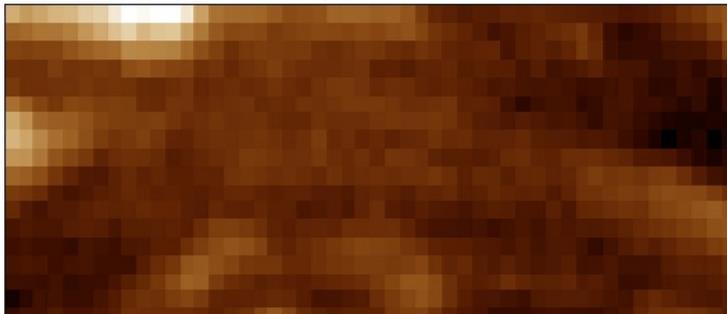
Hi-C filter



Hi-C edge



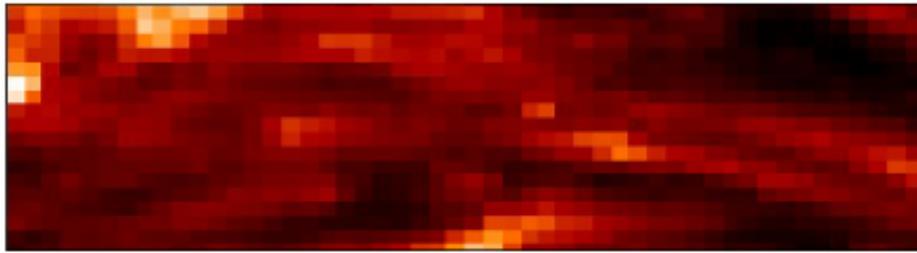
AIA 193



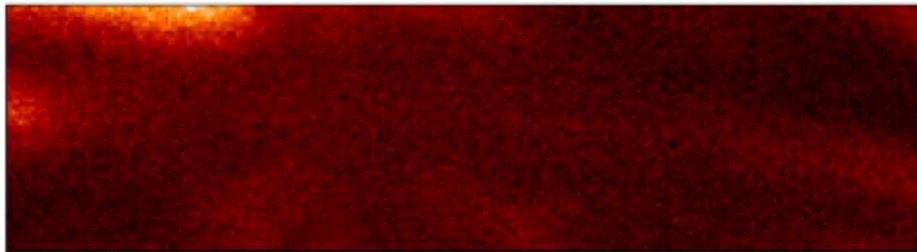
AIA 304



AIA 304 [$\log T^{4.7}$]



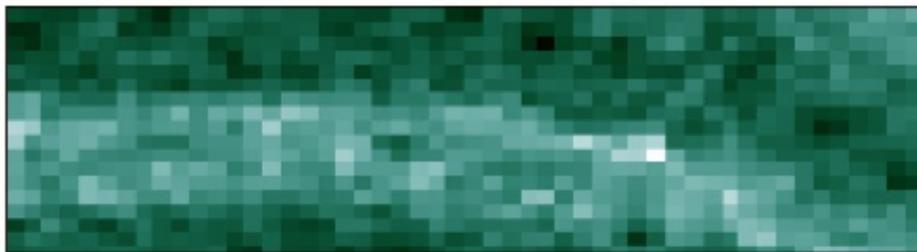
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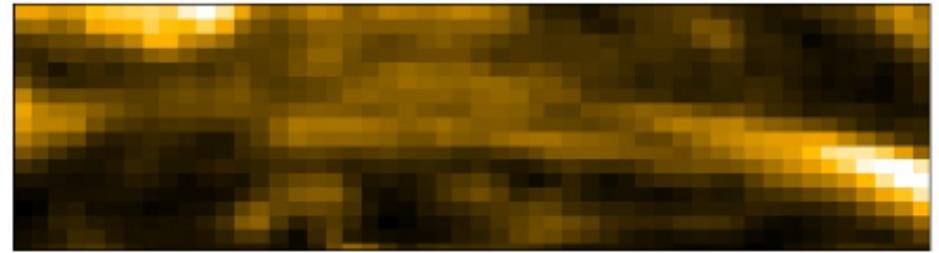
AIA 211 [$\log T^{6.3}$]



AIA 94 [$\log T^{6.8}$]



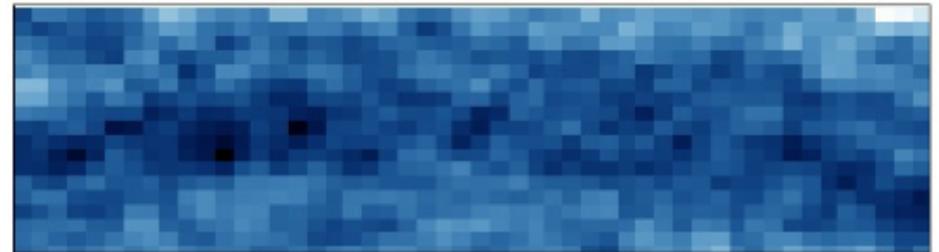
AIA 171 [$\log T^{5.8}$]



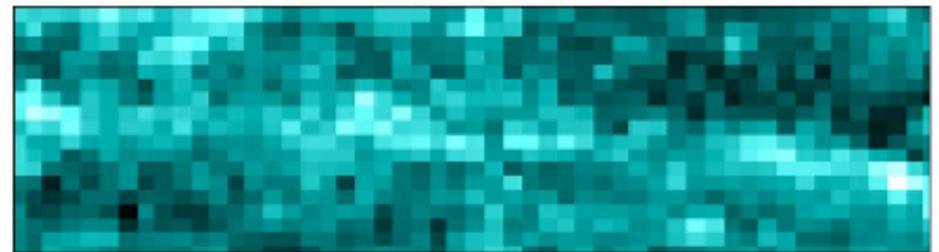
AIA 193 [$\log T^{6.2, 7.3}$]



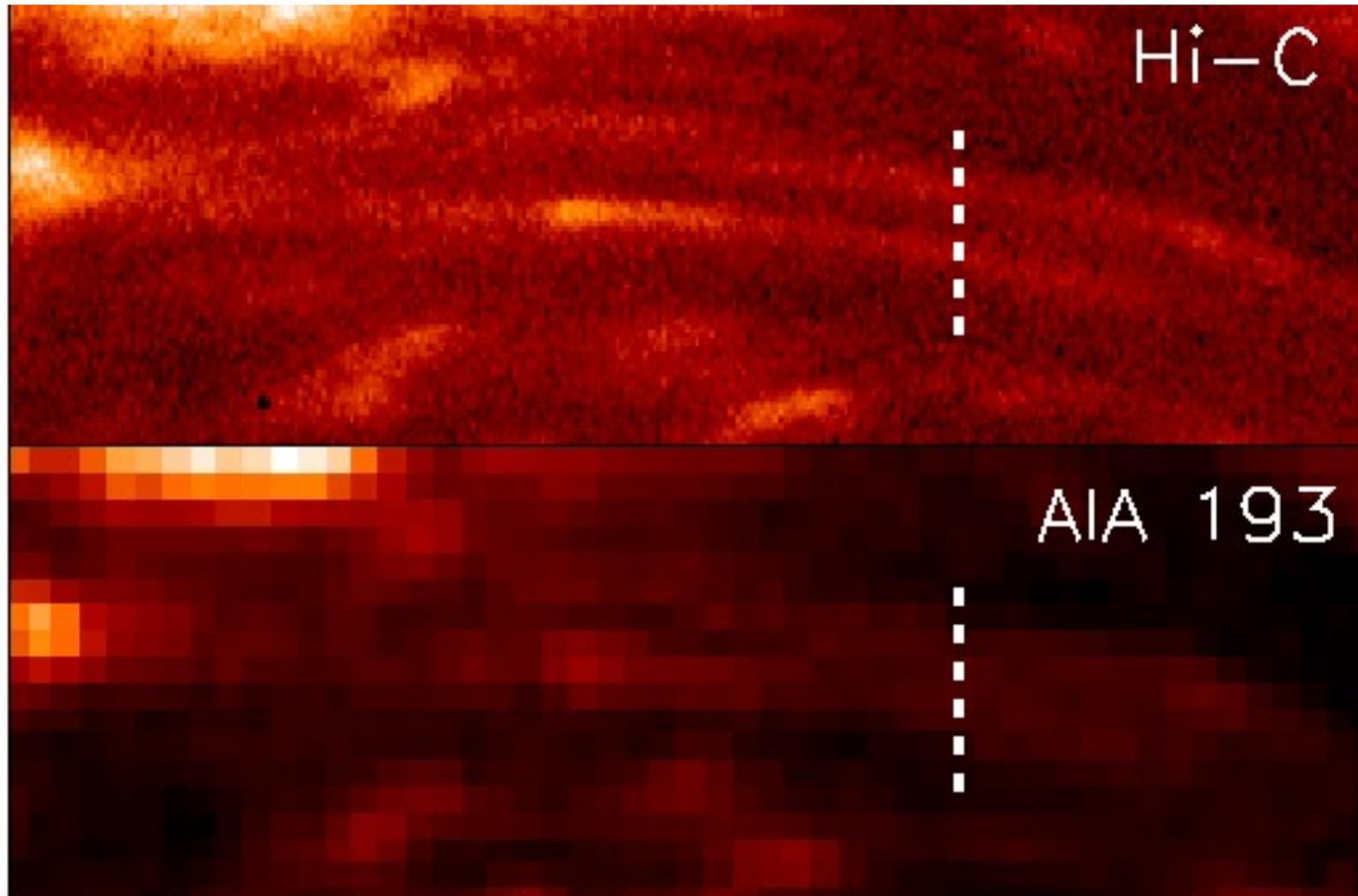
AIA 335 [$\log T^{6.4}$]



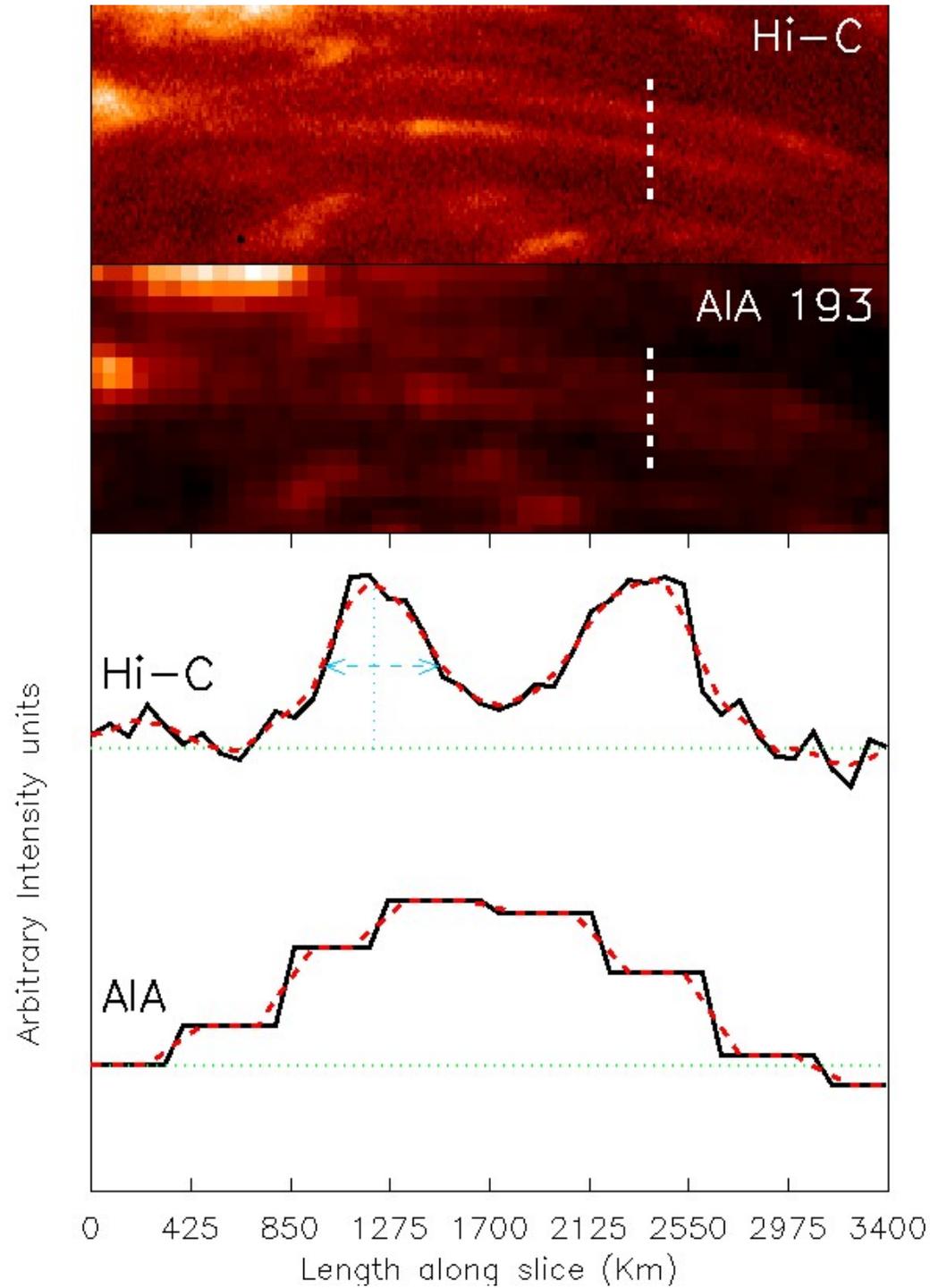
AIA 131 [$\log T^{5.6, 7.0}$]



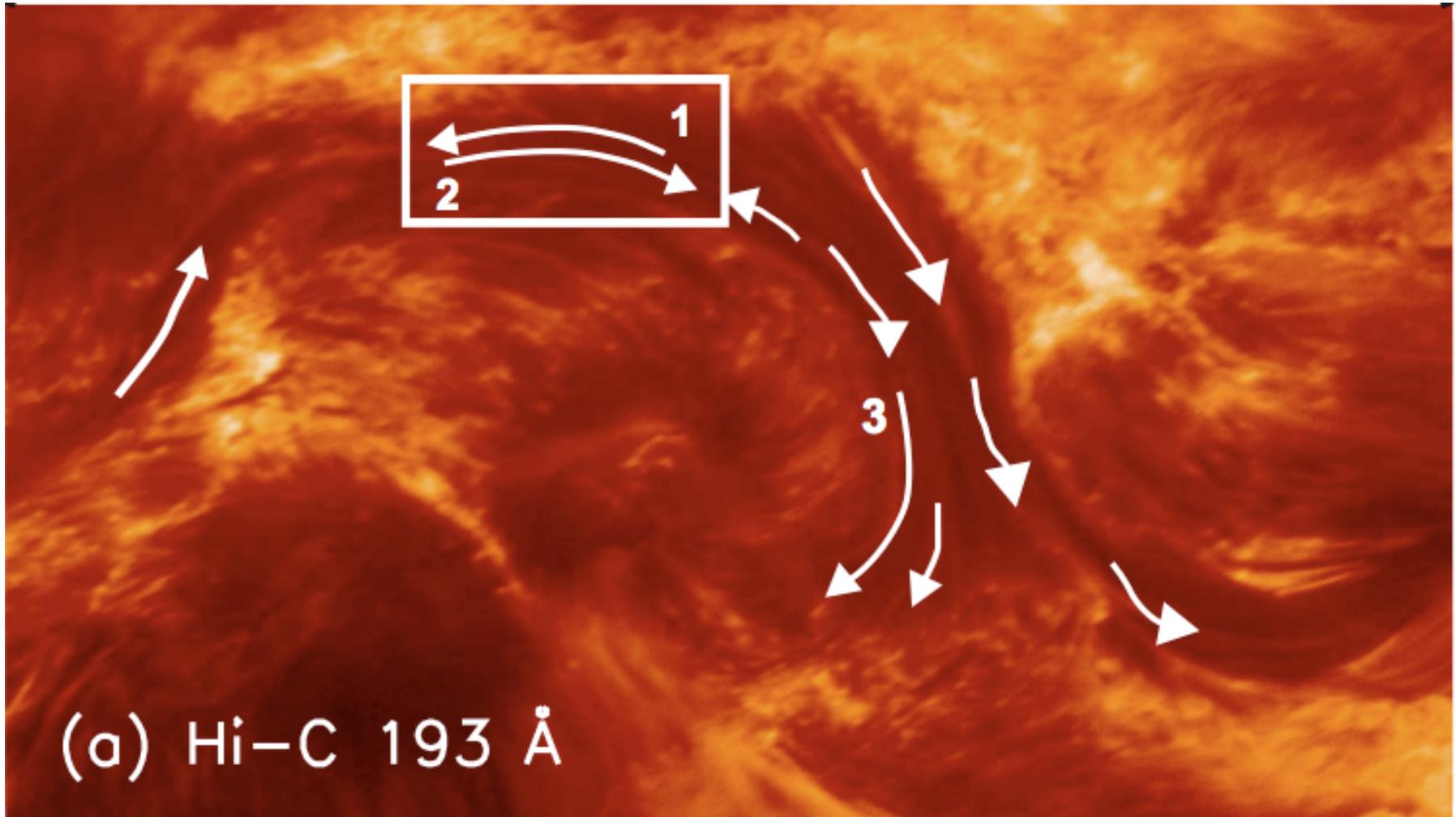
3. Counter-streaming flows

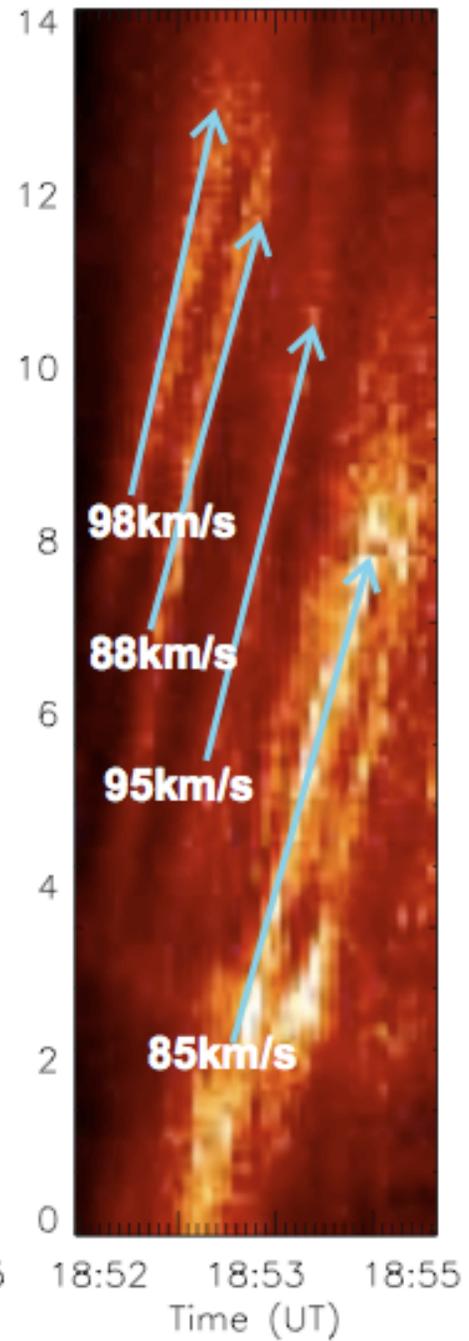
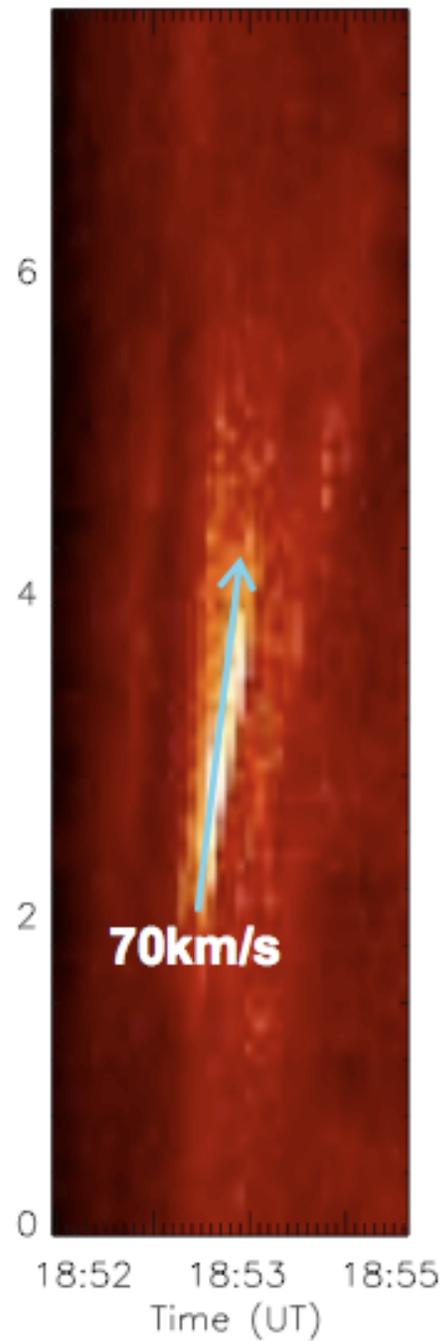
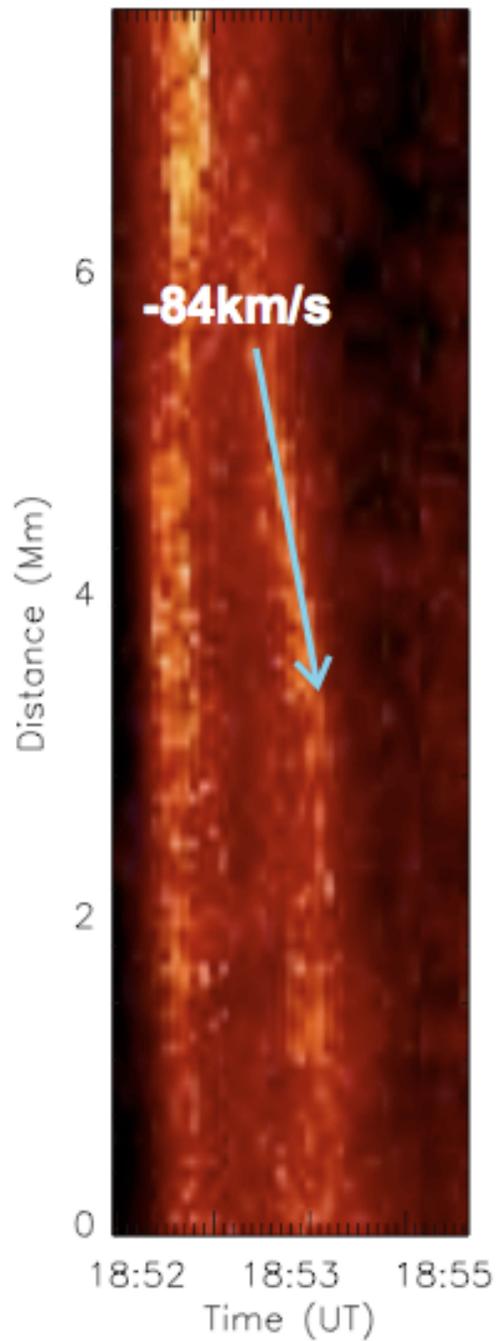


3. Width

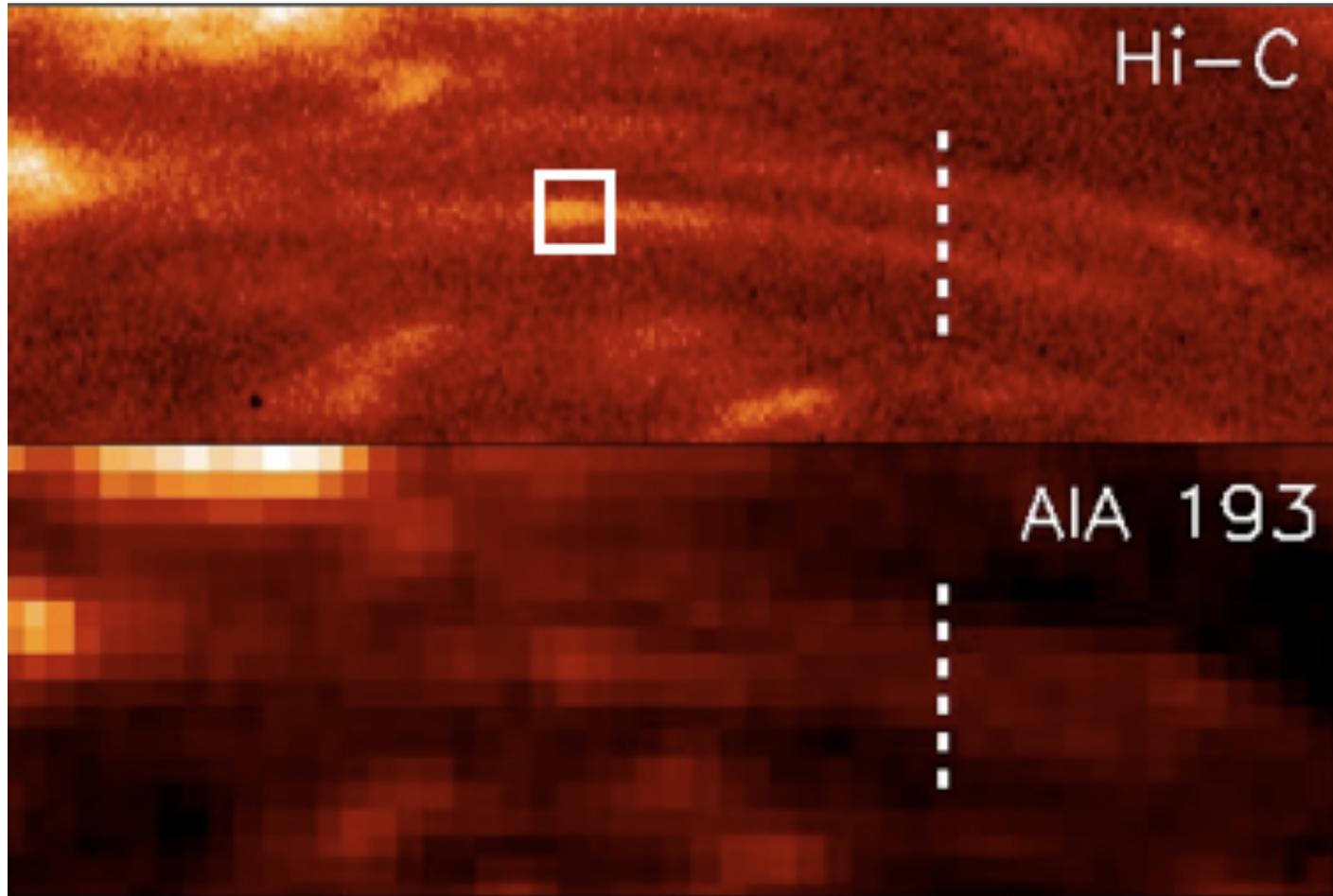


3. Counter-streaming flows

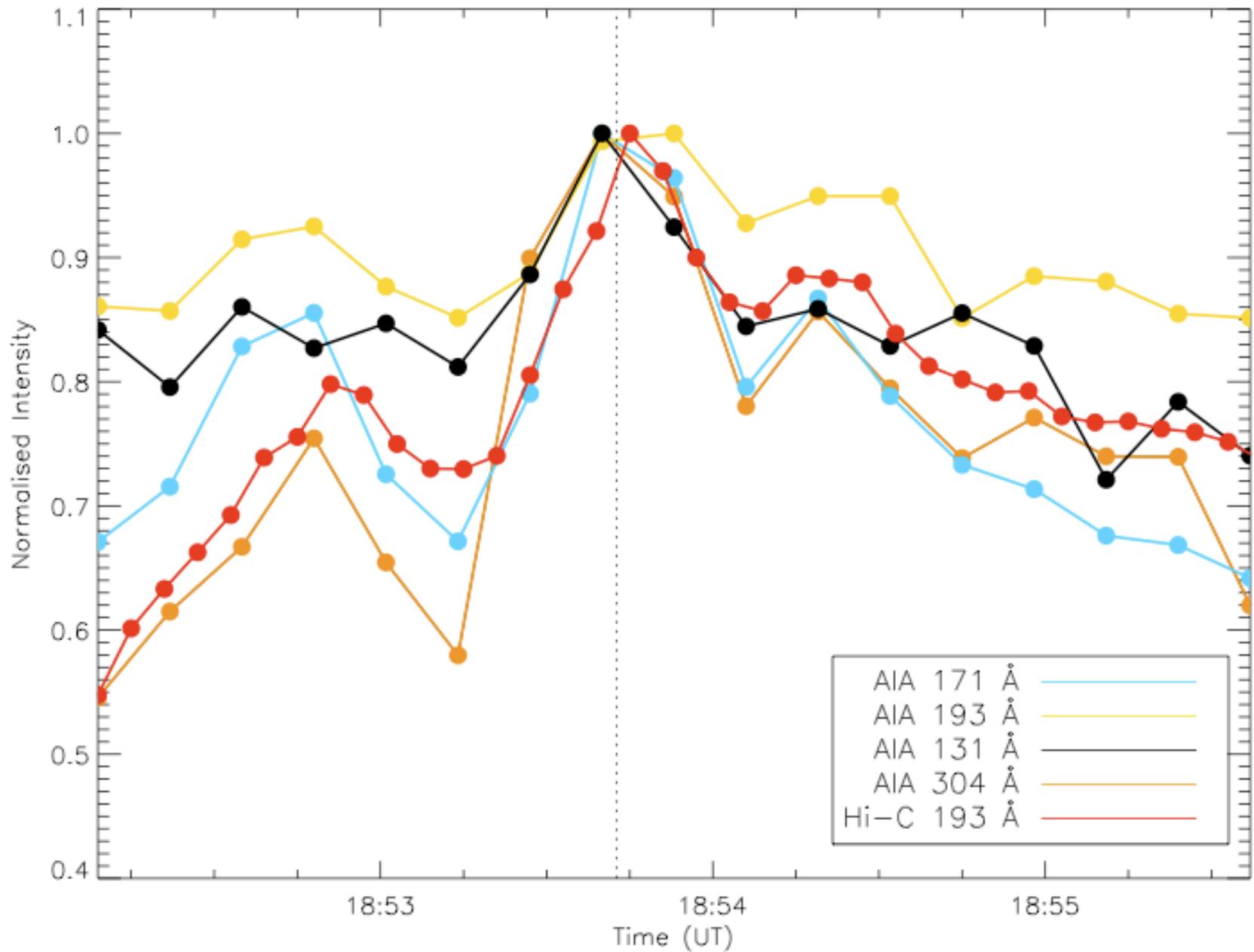




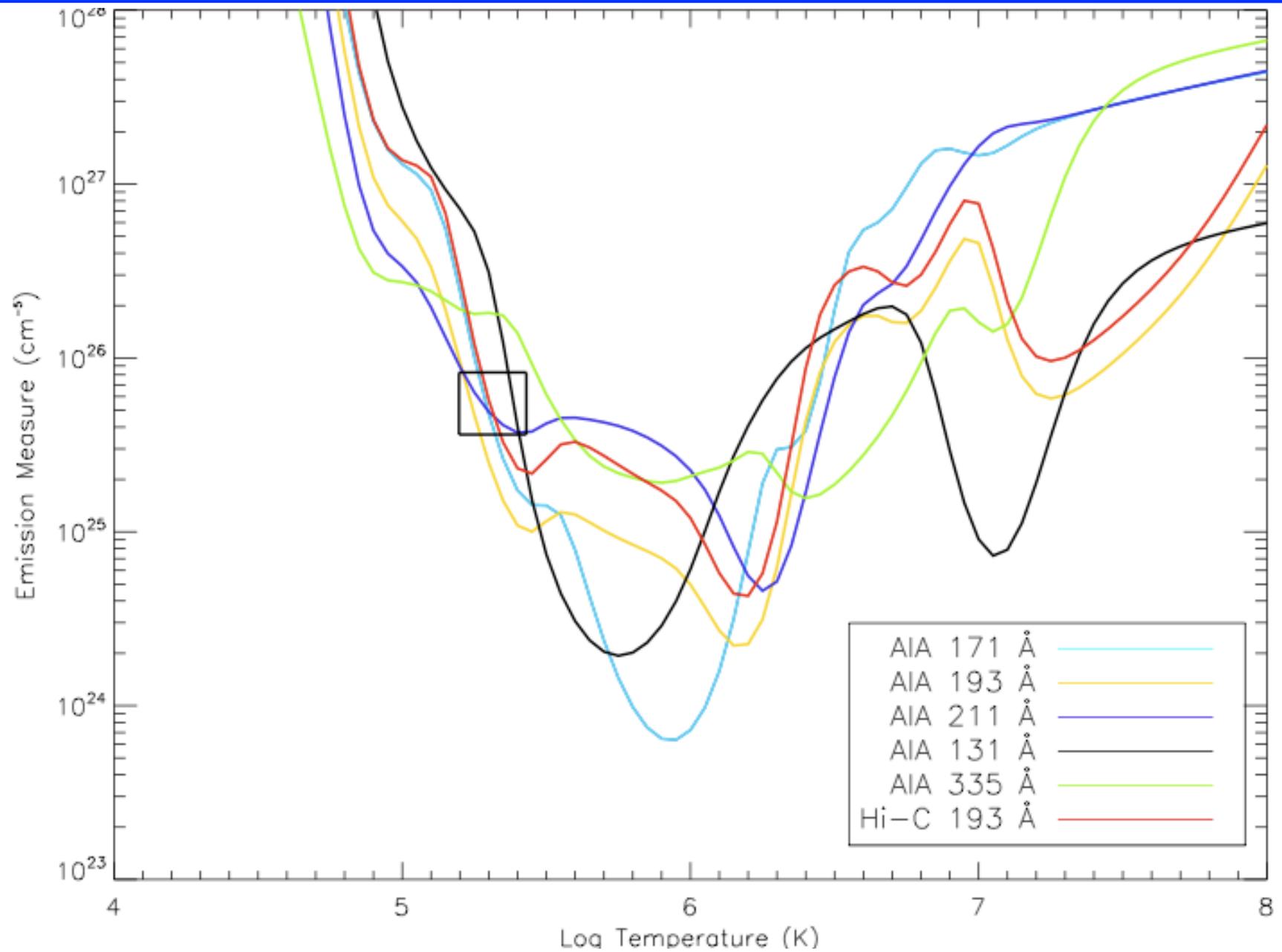
3. Counter-streaming flows



2. Counter-streaming flows



2. Counter-streaming flows



2. Counter-streaming flows - results

- First observation of counter-streaming flows within prominences seen in the EUV at these scales.
- Hi-C clearly resolves the counter-streaming flows in the adjacent filament threads.
- Hi-C can measure the width of these threads and the speeds of the flows where AIA cannot.
- The flows are aligned with the magnetic field and indicate the field is horizontal, not helical.
- These counter-streaming flows are most likely ubiquitous within all filaments.

Summary

- Hi-C obtained the highest spatial and temporal resolution observations ever taken in the solar EUV corona.
- Hi-C reveals dynamics and structure at the limit of its temporal and spatial resolution.
- Hi-C observed various fine-scale features that SDO/AIA could not pick out.

Summary

- For the first time in the corona, Hi-C revealed magnetic braiding and component reconnection consistent with coronal heating.
- Hi-C shows evidence of reconnection and heating in several different regions and magnetic configurations with plasma being heated to $0.3 - 8 \times 10^6$ K temperatures.
- Surprisingly, many of the first results highlight plasma at temperatures that are not at the peak of the response functions.

Thank you for your attention!