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Thermal structure of Coronal Bright Points at their base in the low transition region

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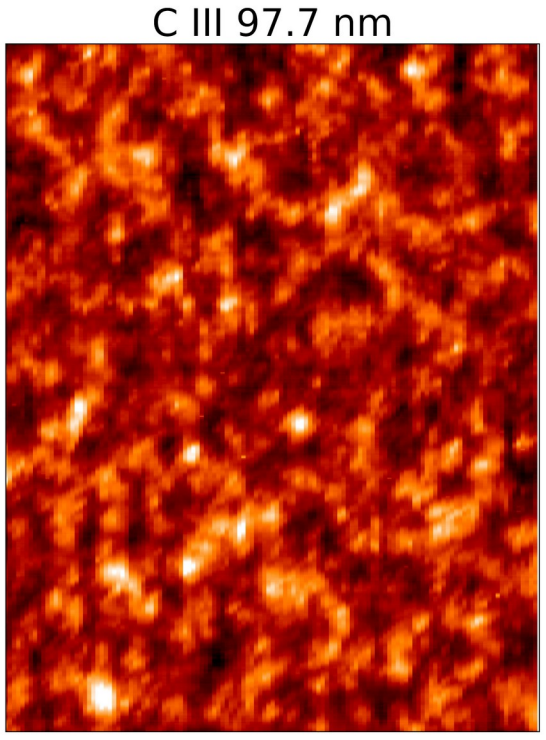
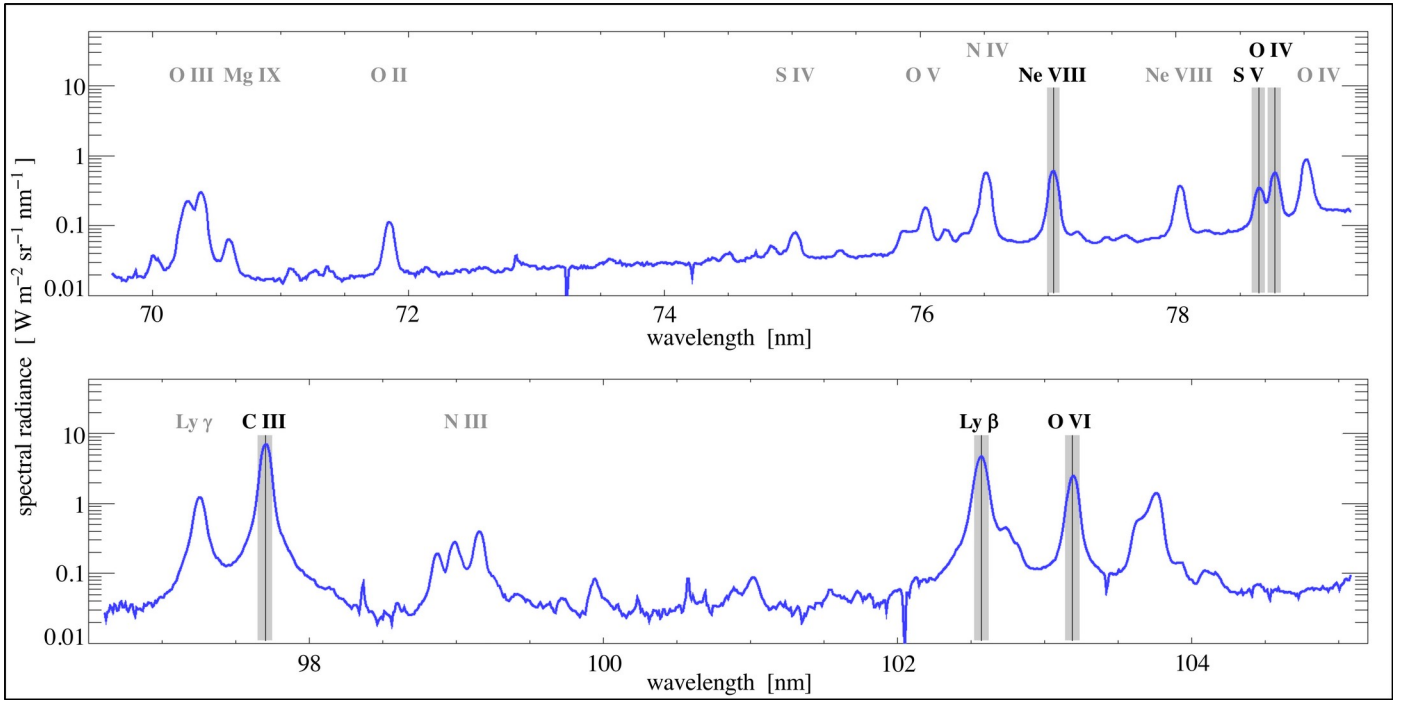
Solar spectra with SPICE

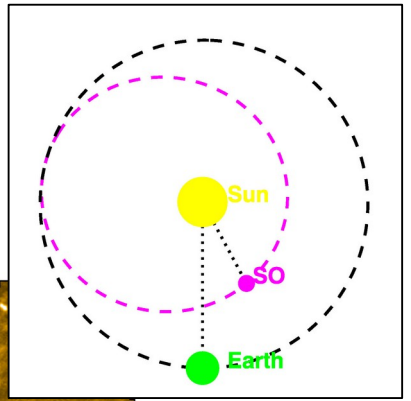


Intensity image of the quiet-Sun from SPICE



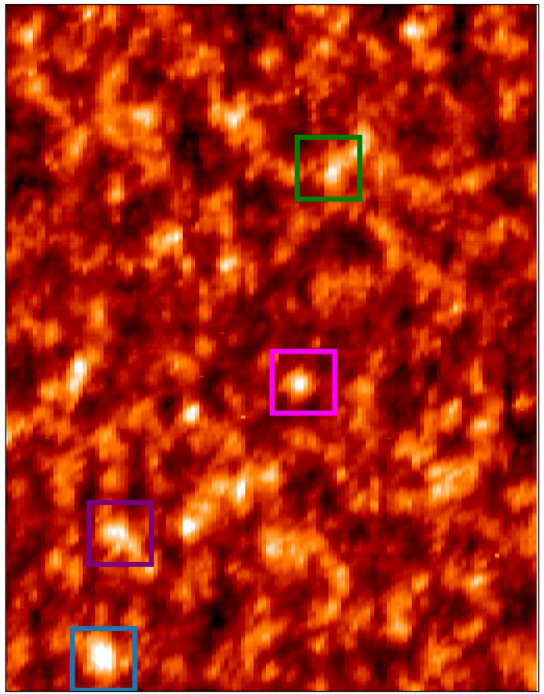
Average quiet-Sun spectrum in range that SPICE can cover

Observation from 28 May 2020

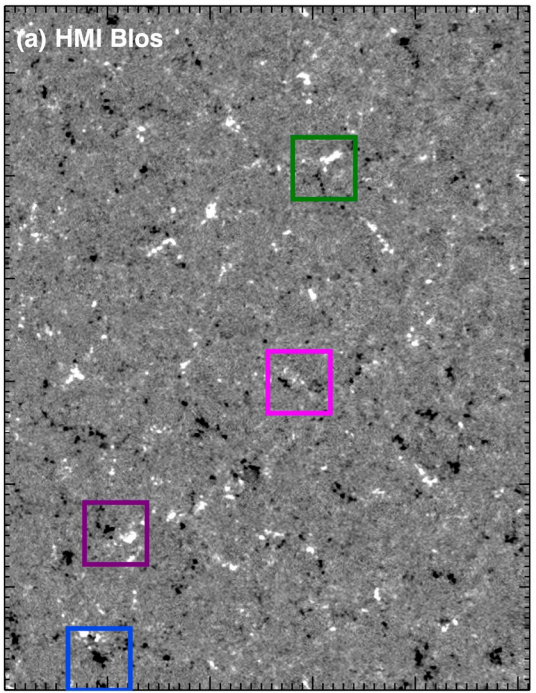


C III 97.7 nm

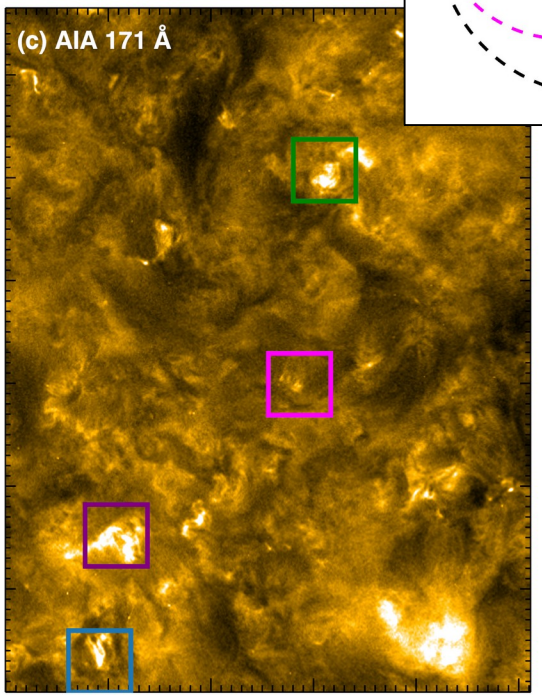
Field of view: (210 x 270) Mm



Intensity image of the quiet-Sun from SPICE



Line-of-sight magnetic field from HMI



AIA in 171 Å band (mostly coronal emission)

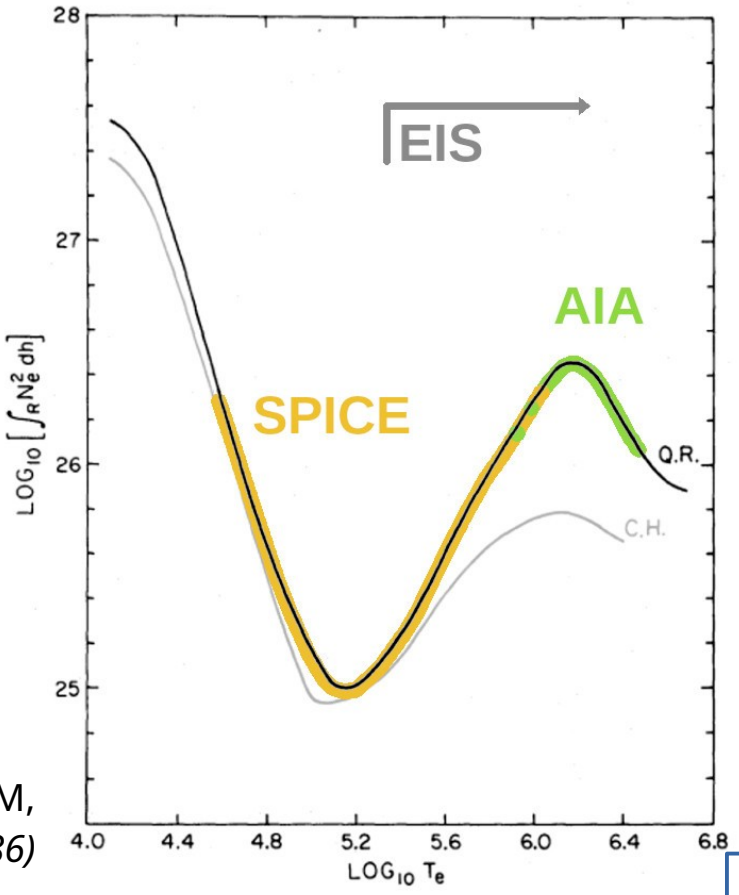
Advantages of SPICE

- Previous spectrometers:

  no *simultaneous* coverage of temperatures from logT = 4 to 6

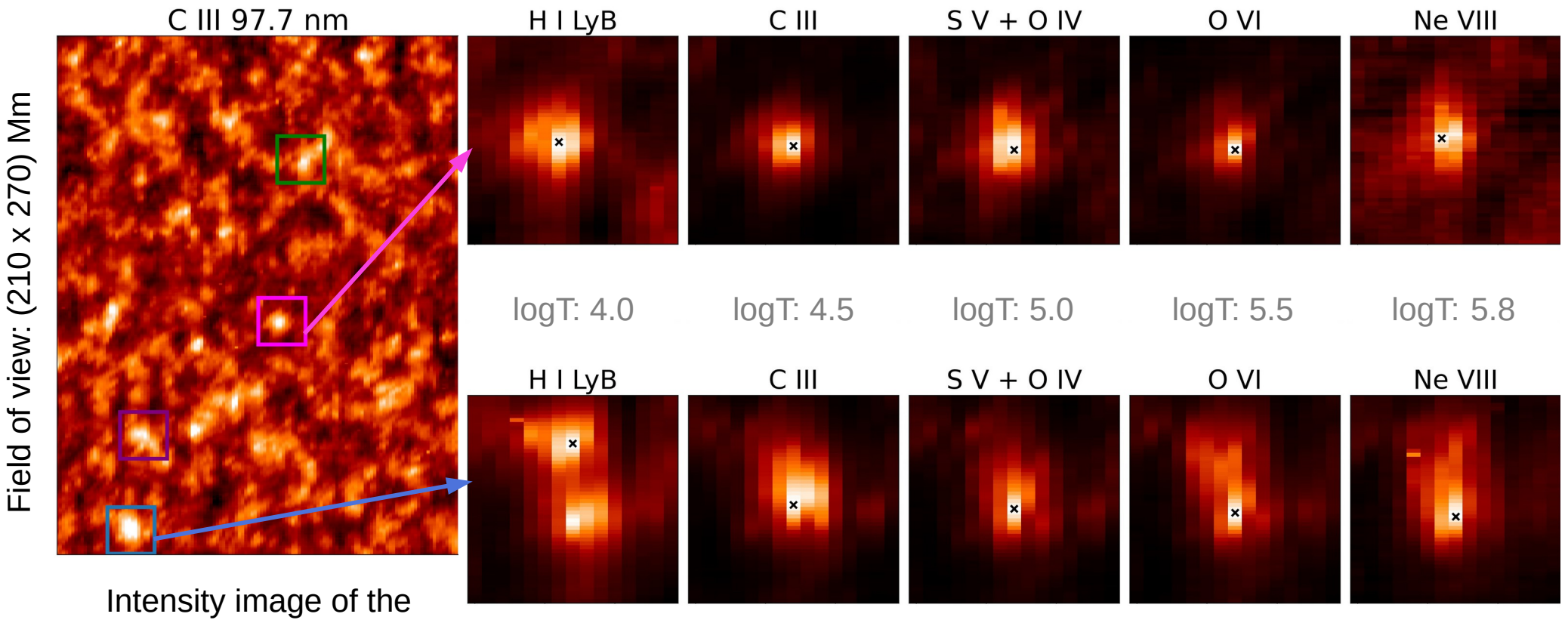
  ➞ SPICE can constrain the emission measure (EM) down to logT = 4.5

- Particularly important to constrain the slope towards lower temperatures
- When possible, it can be extended with AIA up to logT = 6.5

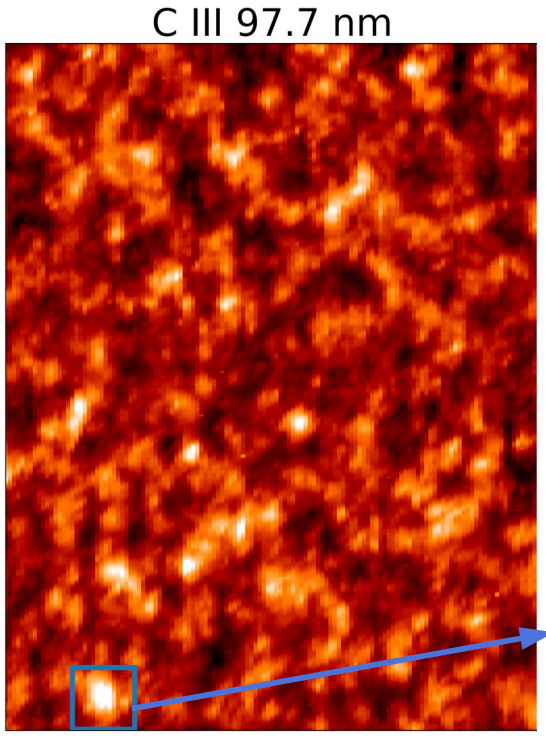


Quiet Sun and Coronal Hole EM,
from Raymond & Doyle 1981 *(ApJ 247, 686)*

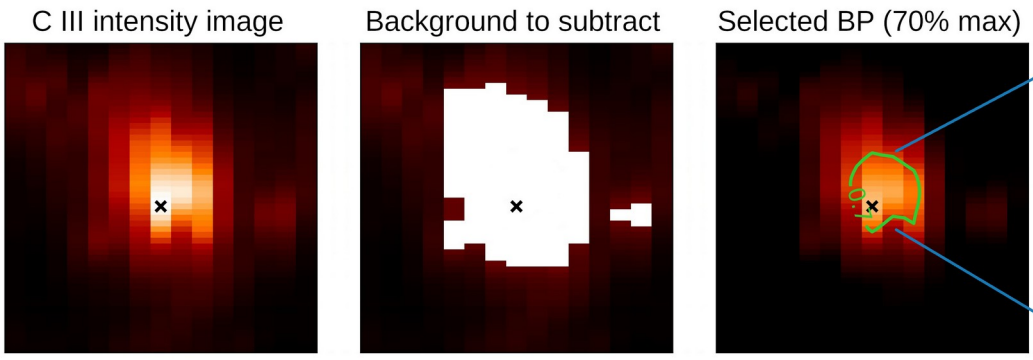
Structure of the bright points

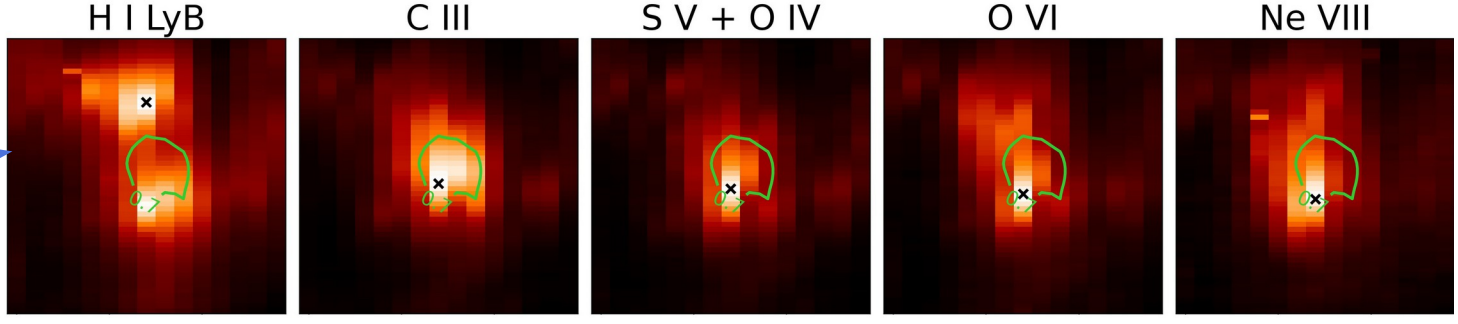


Selecting the bright point



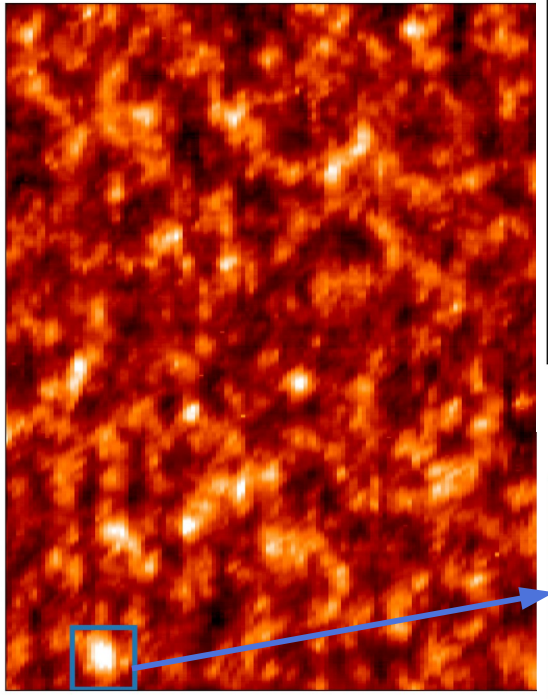
Intensity image of the quiet-Sun from SPICE



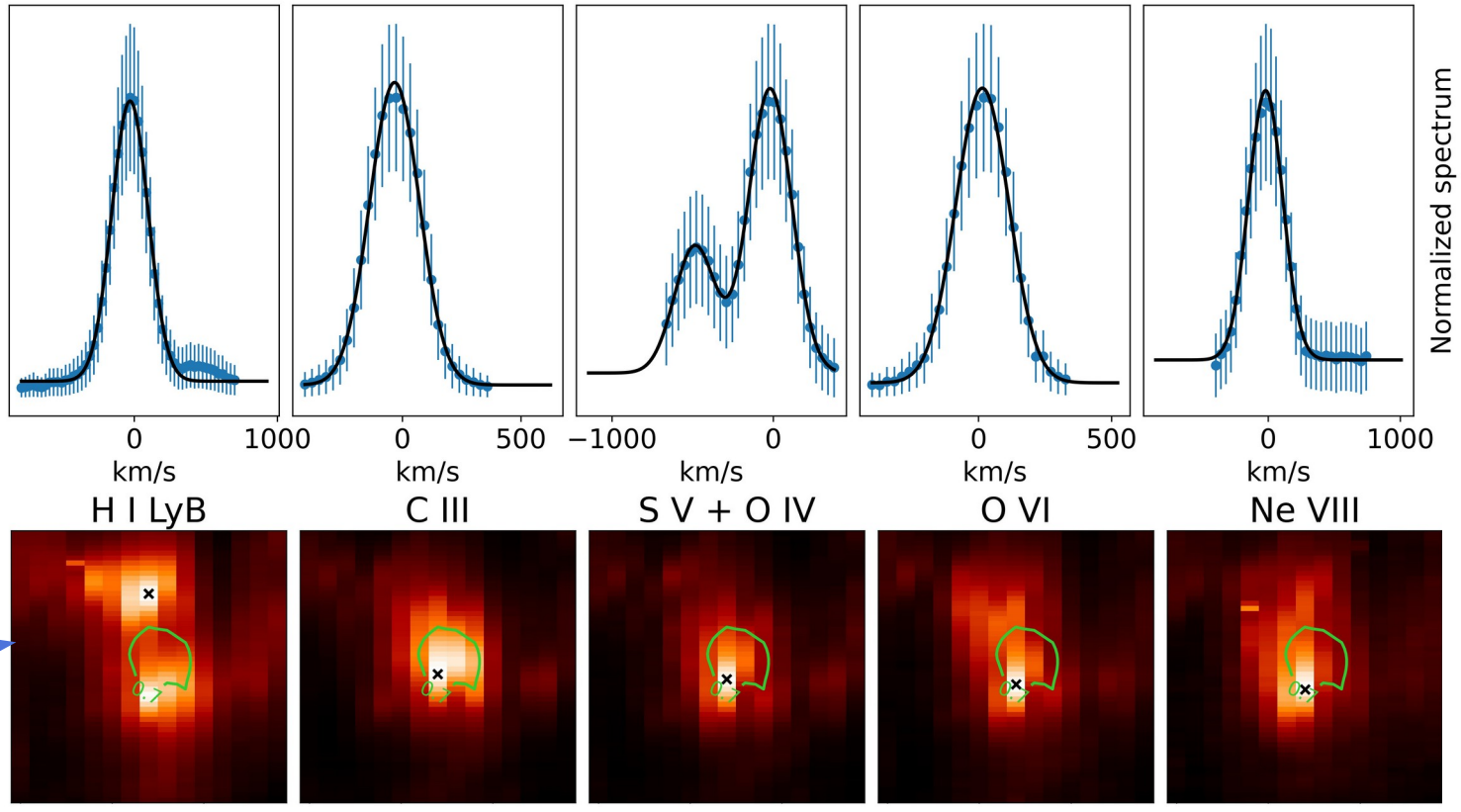


Zoom-in: (24.5 x 24.5) Mm

Average spectrum of a bright point



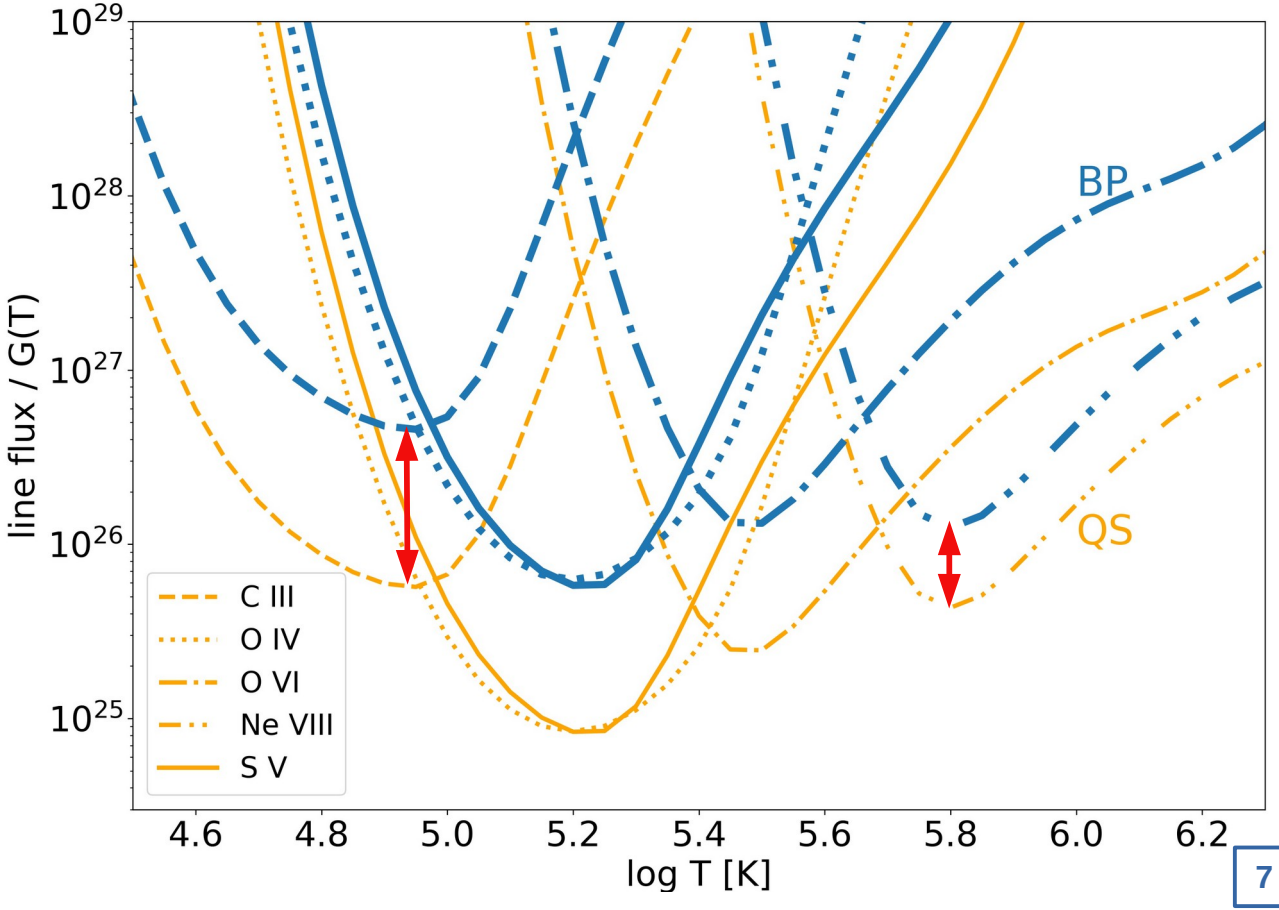
Intensity image of the quiet-Sun from SPICE



Zoom-in: (24.5 x 24.5) Mm

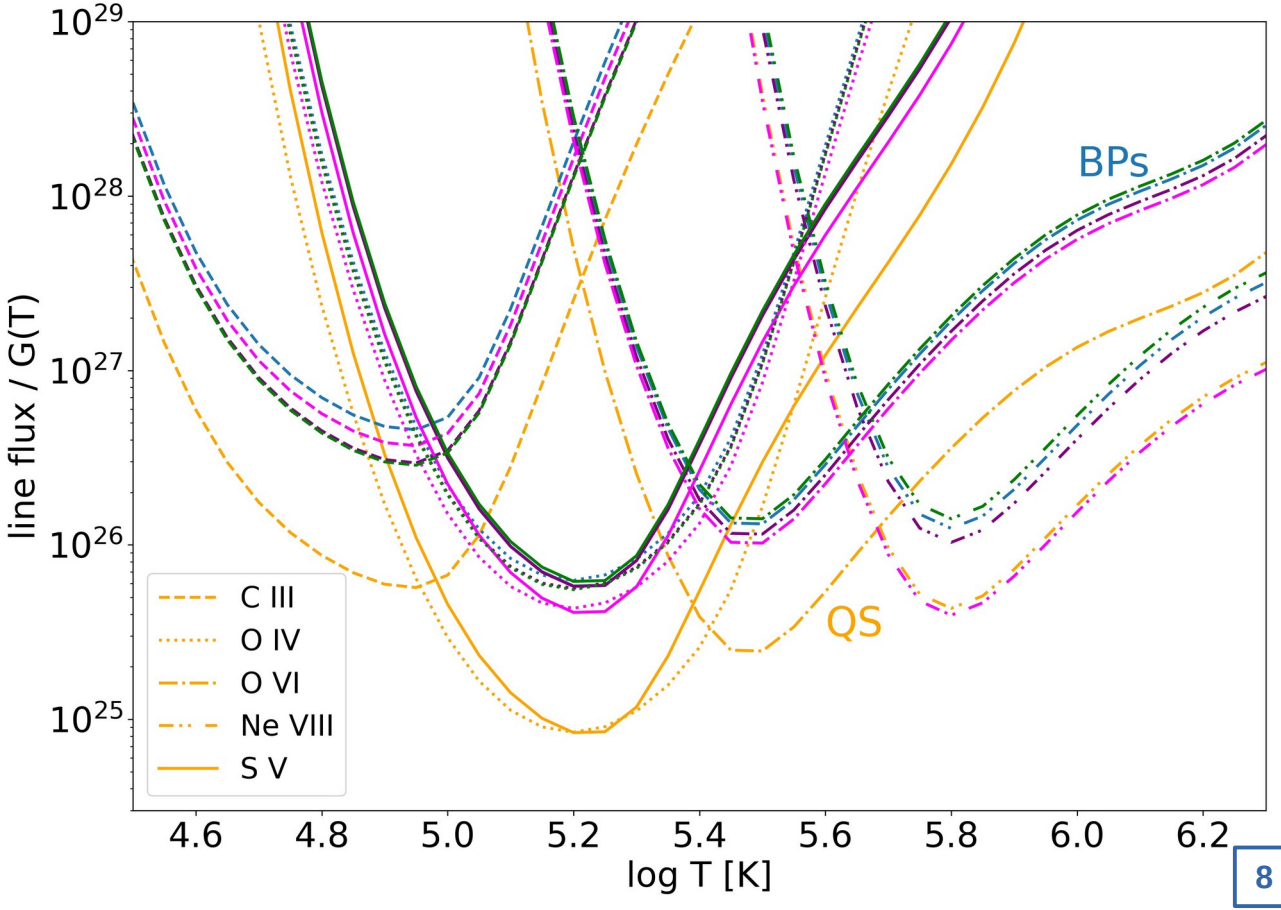
Emission measure loci of BP and QS

- QS EM loci follow the expected variation
- BP shows higher EM, as expected
- But stronger enhancement of the BP EM at lower temperatures



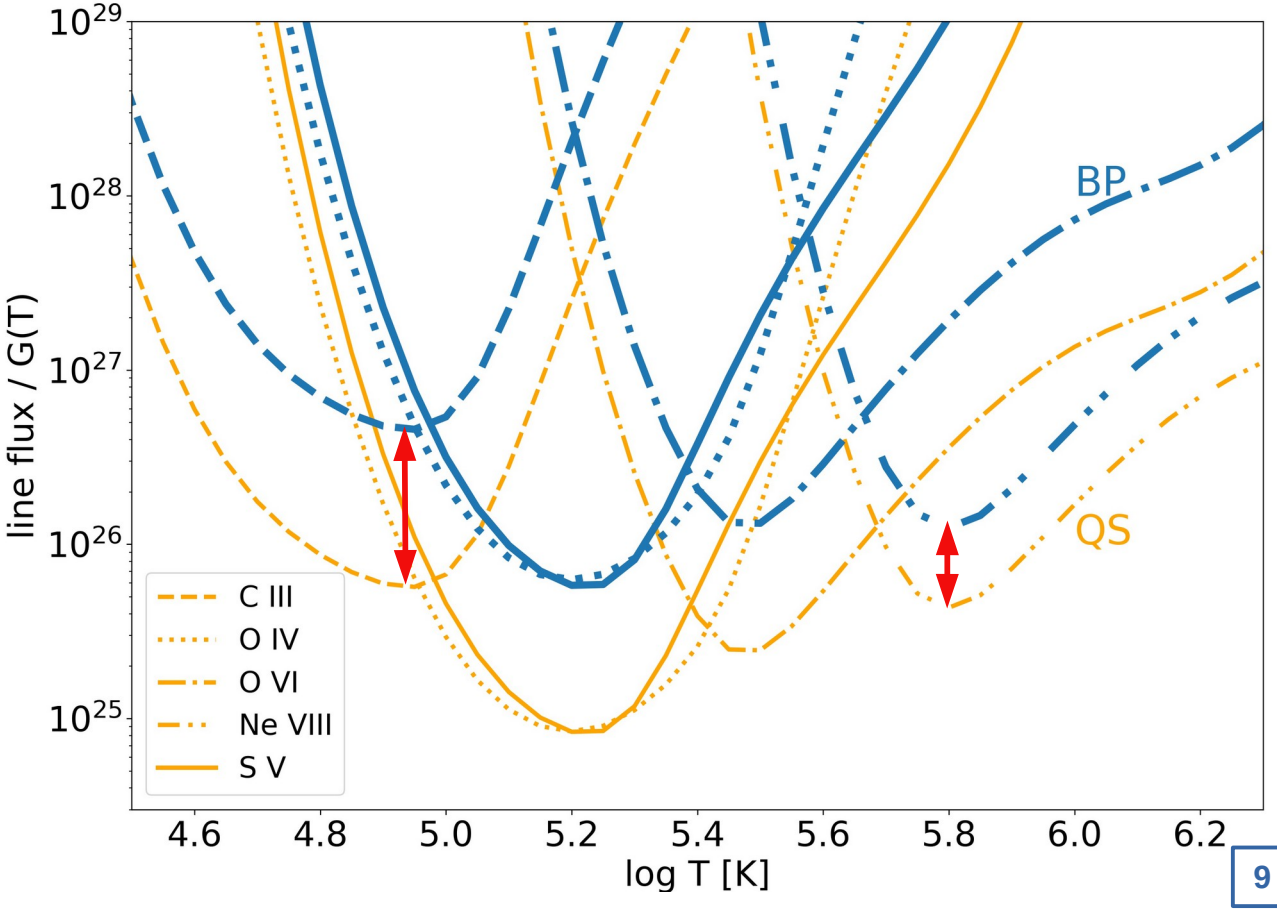
Emission measure loci of BP and QS

- QS EM loci follow the expected variation
- BP shows higher EM, as expected
- But stronger enhancement of the BP EM at lower temperatures
- Results are consistent across all BPs



Conclusions

- SPICE observations can provide insights into the heating processes
- Despite their name, these results suggest that coronal BPs have a bigger impact at transition region temperatures
- Possibly most energy is input at low temperatures
- Build statistics, combine with AIA observations



Thank you!