

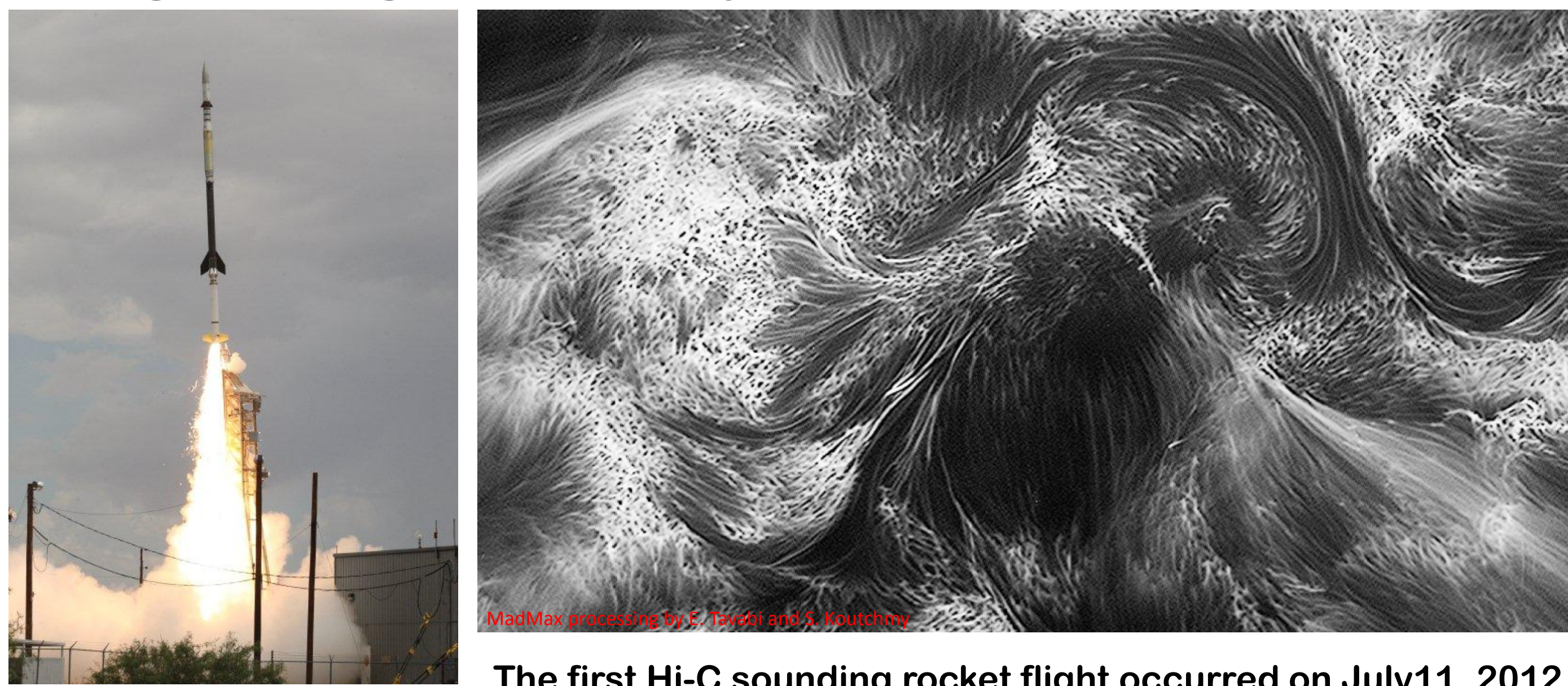
Two Directions for Coronal EUV Observations

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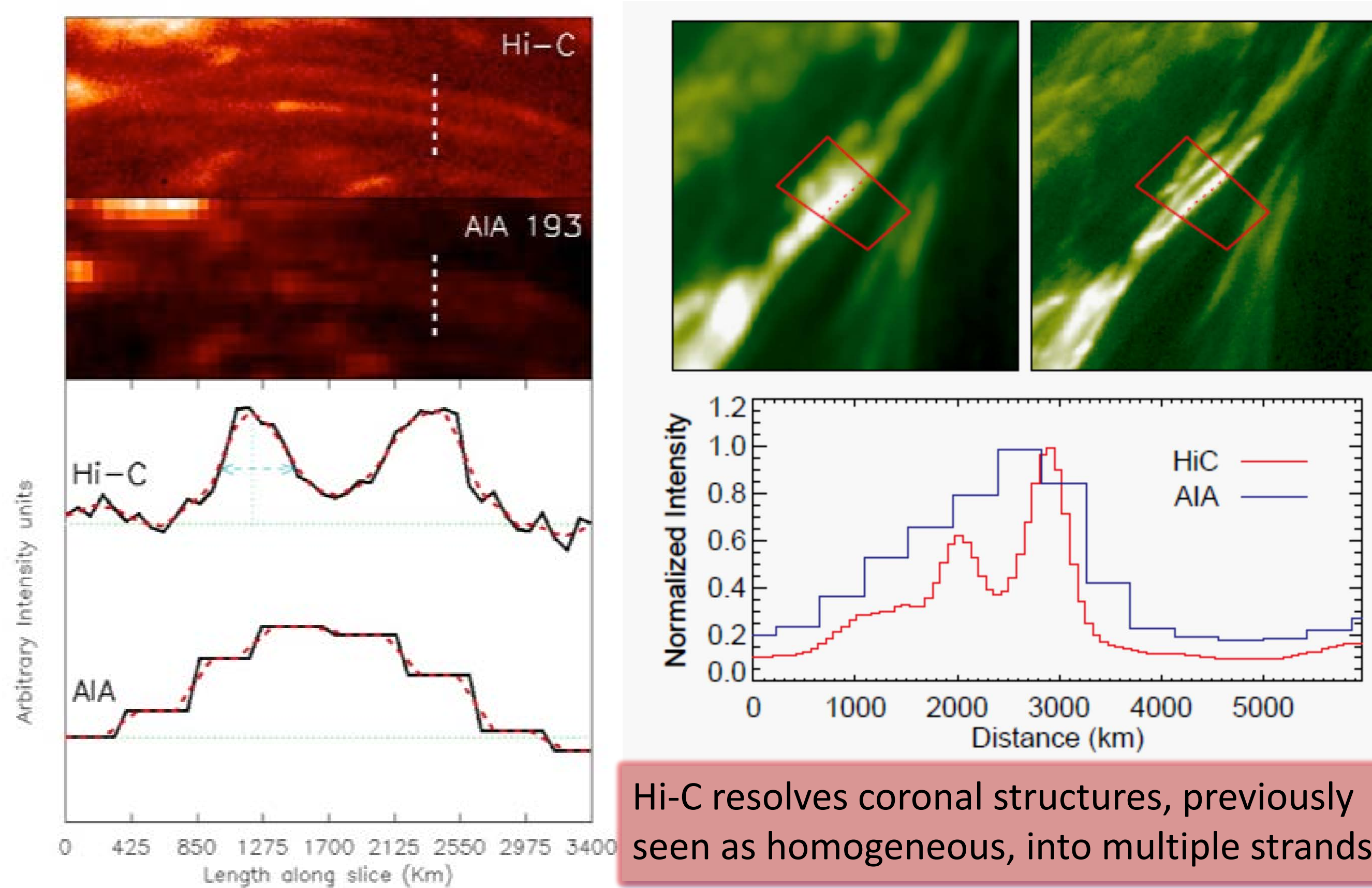
Inward: High Resolution for Studies of Heating & Dynamics

The Hi-C sounding rocket has shown that detecting turbulence, braiding, twist and reconnection in coronal structures requires high (0".1) pixel resolution imaging at coronal temperatures.

- The Hi-C telescope obtained very high resolution coronal images at 193Å for ≈5 minutes.
- A second flight of Hi-C, with a new EUV multilayer coating for Fe IX (171Å) and He II (304Å), has been proposed.
- For more meaningful advances to be made after the next flight, a longer duration space-based mission is needed.



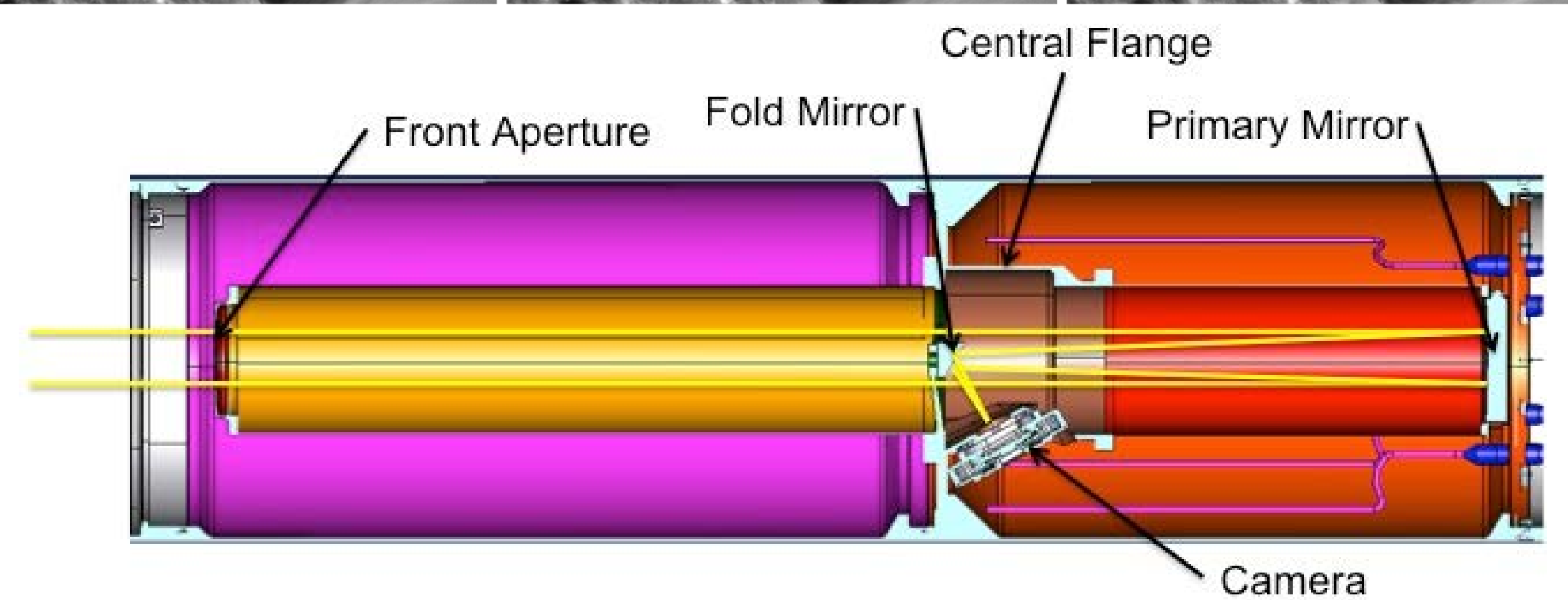
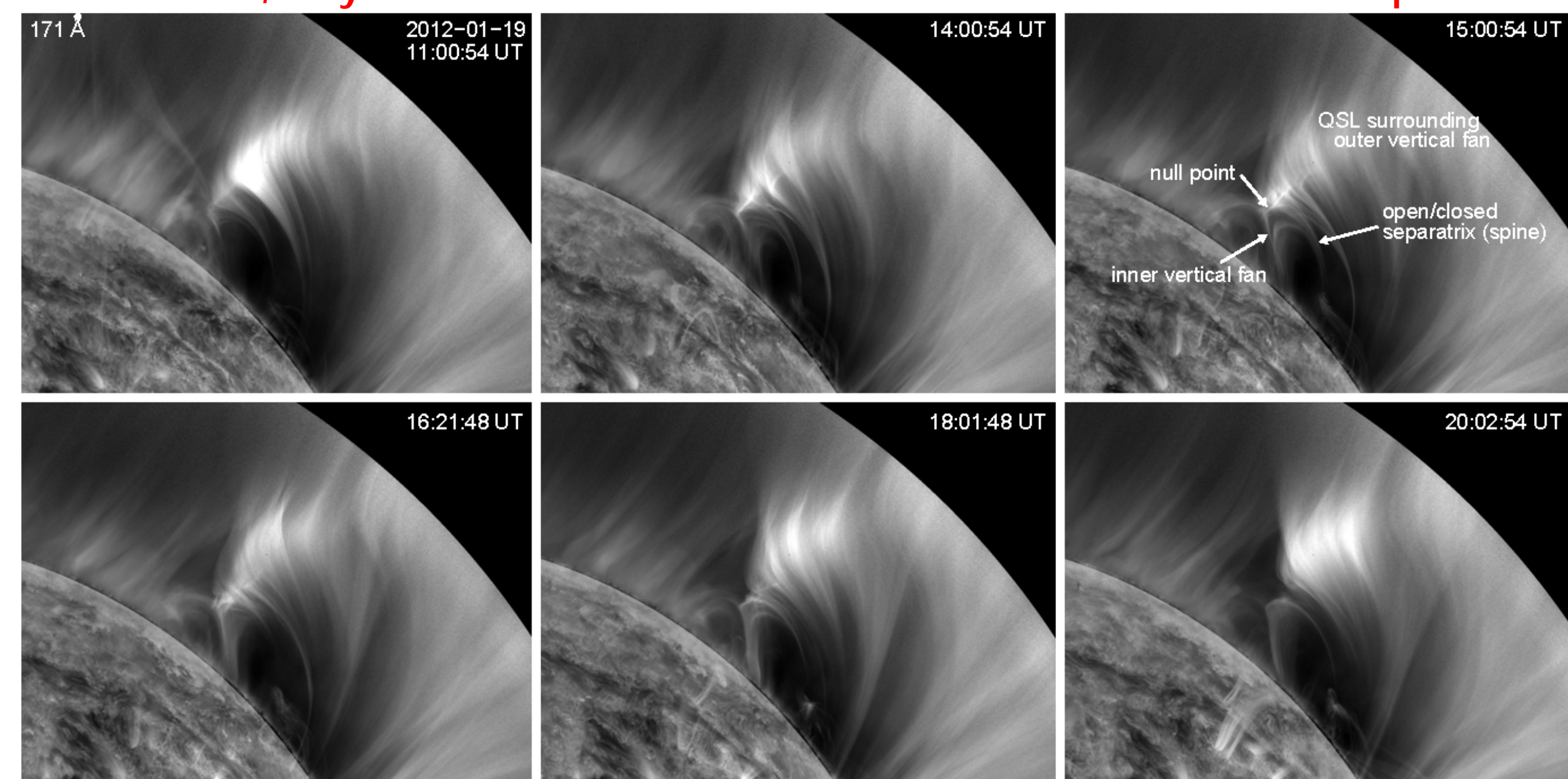
The first Hi-C sounding rocket flight occurred on July 11, 2012.



Outward: Wide Field View of the Transition Corona

- High-sensitivity EUV imaging can provide detection of the hot corona out to at least 3 R_{\odot} .
- Simultaneous on-disk imaging is easily done.
- CMEs are observable on-disk and out to at least 5 R_{\odot} .
- Diffraction is not a limitation in the EUV.
- Disk/limb contrast is 1000X lower than in white light.
- Spatial resolution of 1-2 arc second is easily attained over the entire FOV.

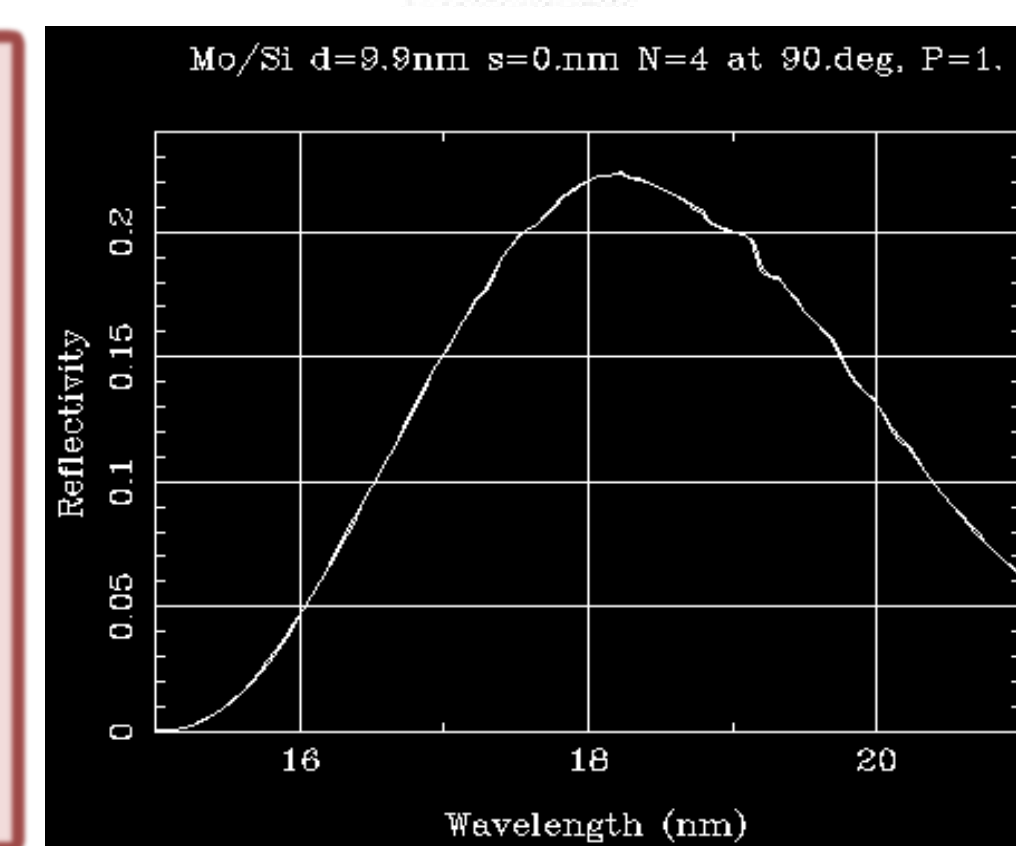
Q: Where, why and how does the corona transition from closed to open?



EUVC+: Prime-focus broadband (171-211Å) EUV imager for high throughput and on/off-disk imaging over a wide temperature range (0.8–2.5 MK).

Lines included in the passband: Fe IX, O V, O VI, Fe X, Fe XI, Fe XII, Fe XXIV, Fe XIII, Fe XIV.

Ultra-high sensitivity and large dynamic range for detection of coronal structures and CMEs from the Solar disk continuously out to >5 Solar diameters.



Possible dual-band coatings for the Hi-C 2nd flight:

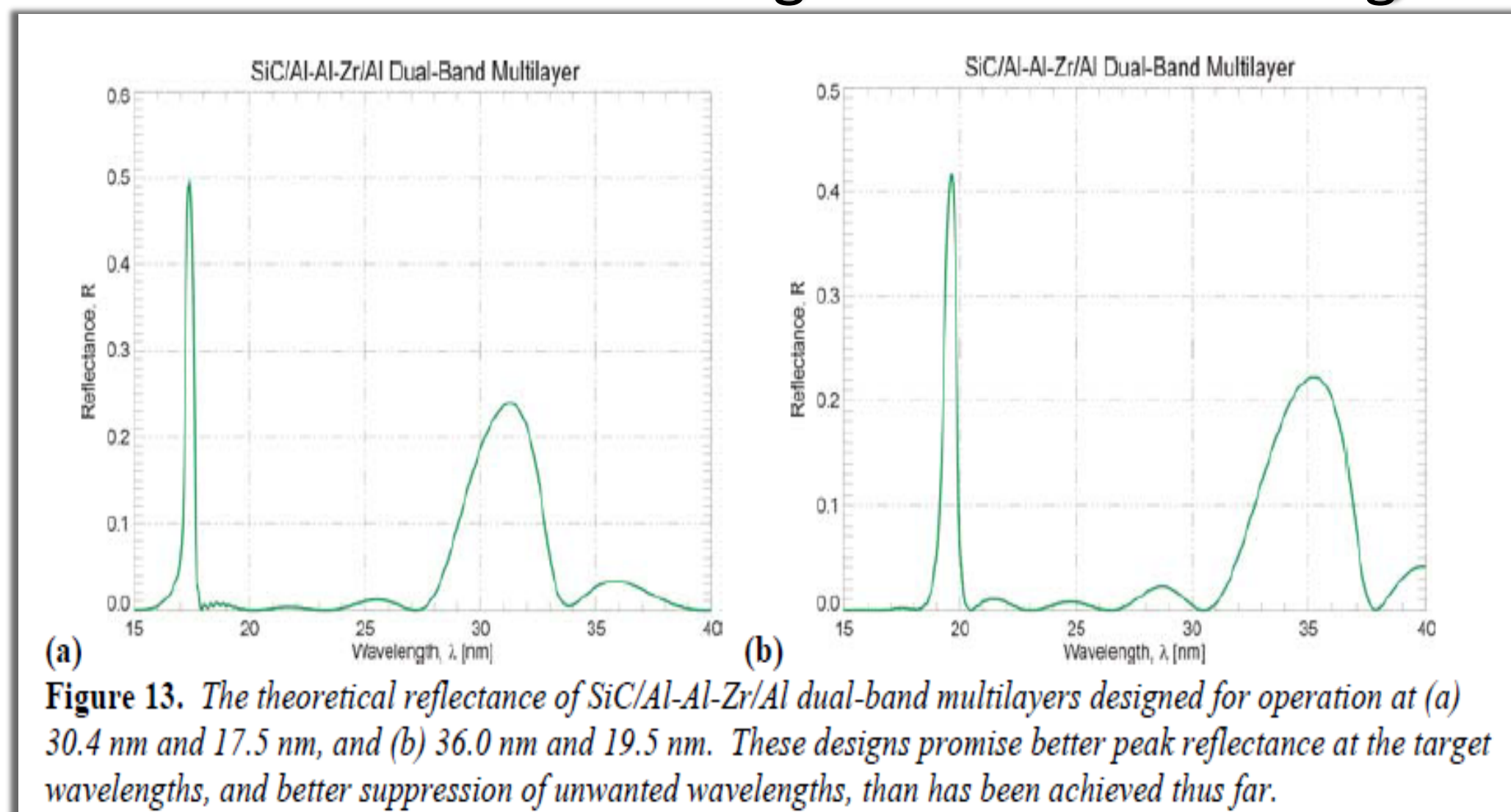
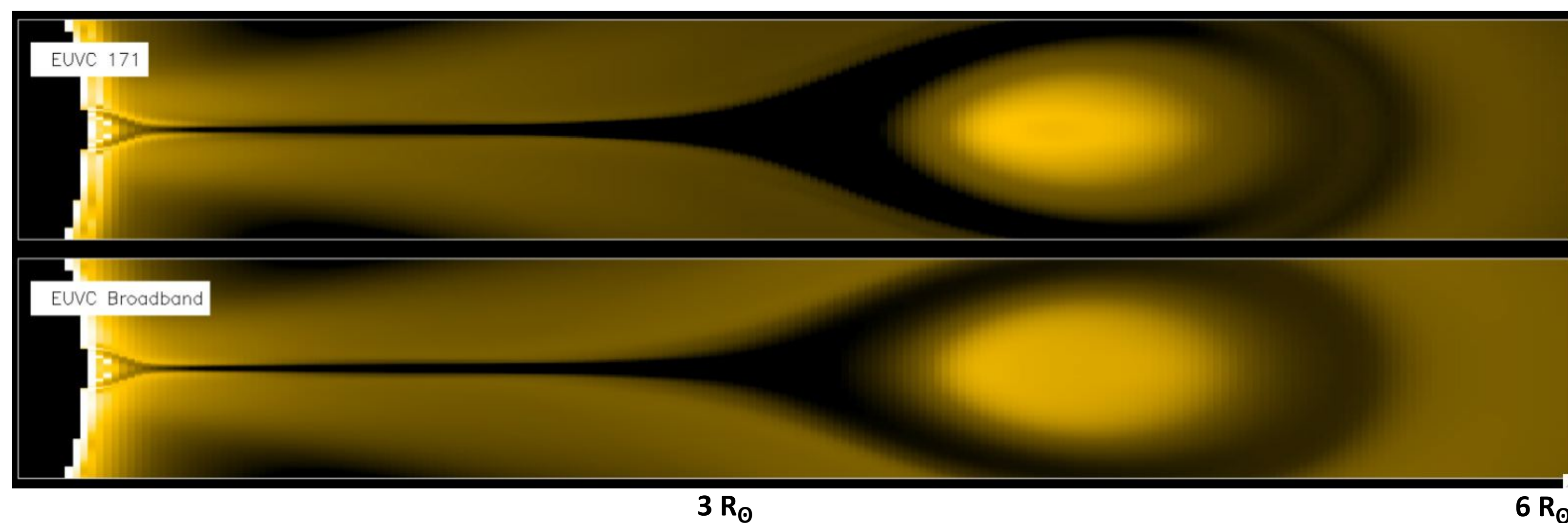


Figure 13. The theoretical reflectance of SiC/Al-Zr/Al dual-band multilayers designed for operation at (a) 30.4 nm and 17.5 nm, and (b) 36.0 nm and 19.5 nm. These designs promise better peak reflectance at the target wavelengths, and better suppression of unwanted wavelengths, than has been achieved thus far.



3 R_{\odot}

6 R_{\odot}

References

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- Testa, P., *et al.*, 2013, ApJL, **770**, L1, "Observing Coronal Nanoflares in AR Moss".
- Masson, S., McCauley, P., Golub, L., Reeves, K.K. and DeLuca, E.E., 2013, ApJ. "The Transition Corona", (submitted).
- Peter, H., *et al.*, 2013, A&A, "Structure of Coronal Loops", (submitted).
- Brooks, D.H., *et al.*, 2013, ApJ, "High Spatial Resolution Observations of Loops in the Solar Corona", (in press).
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- CMEs will be visible in 1 min. exposures out to at least 5-6 R_{\odot}
- Streamers visible out to 5-7 R_{\odot} with ≈30 sec. exposure times
- Broadband coating ensures visibility of CME over wide T range

