Reconstruction of the EUV streamer from SWAP coronal synoptic map

V. Slemzin (LPI)

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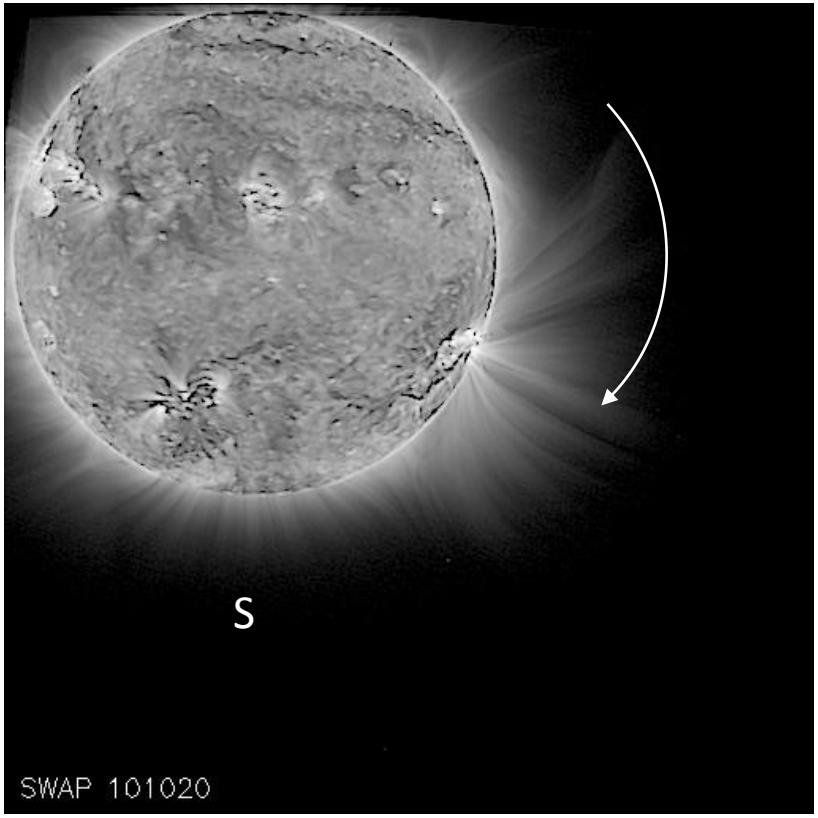
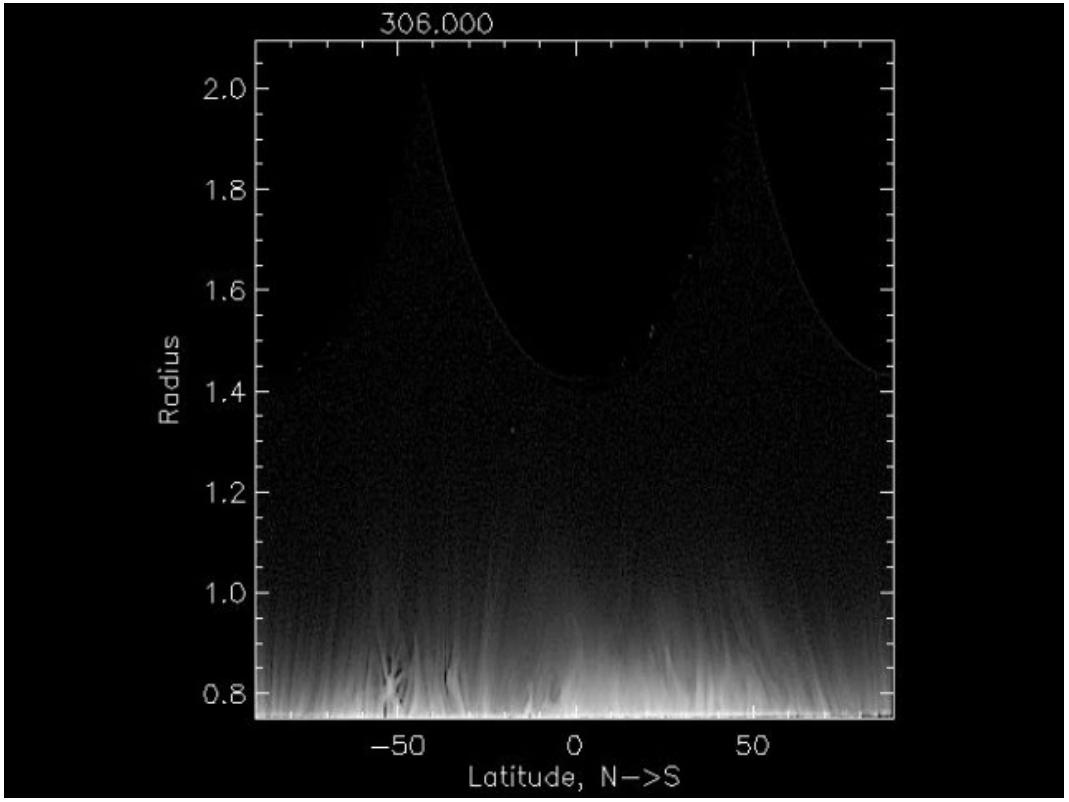
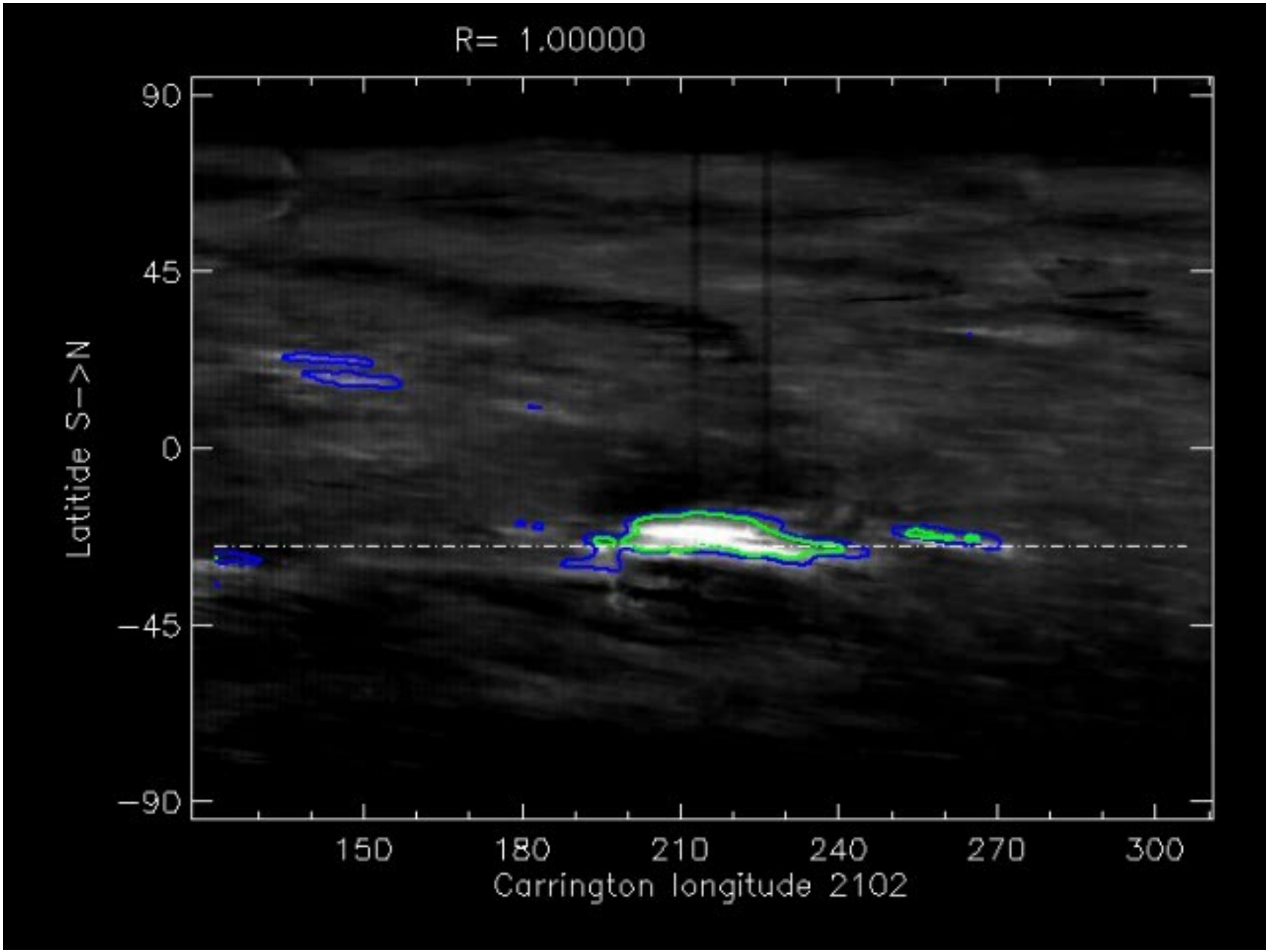
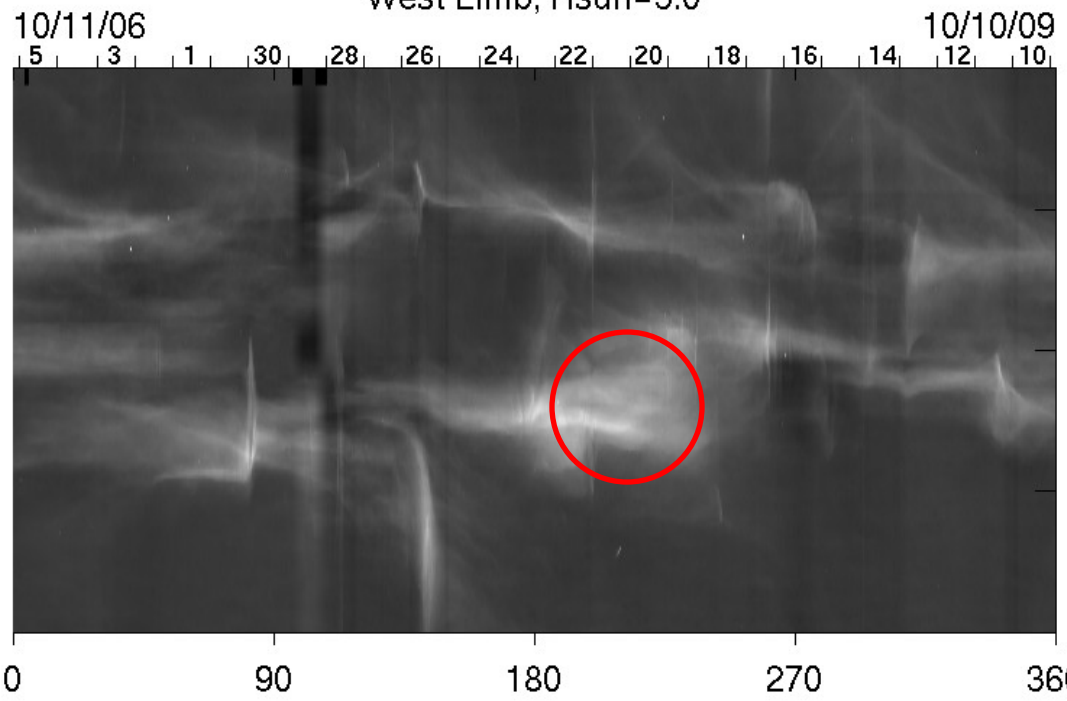




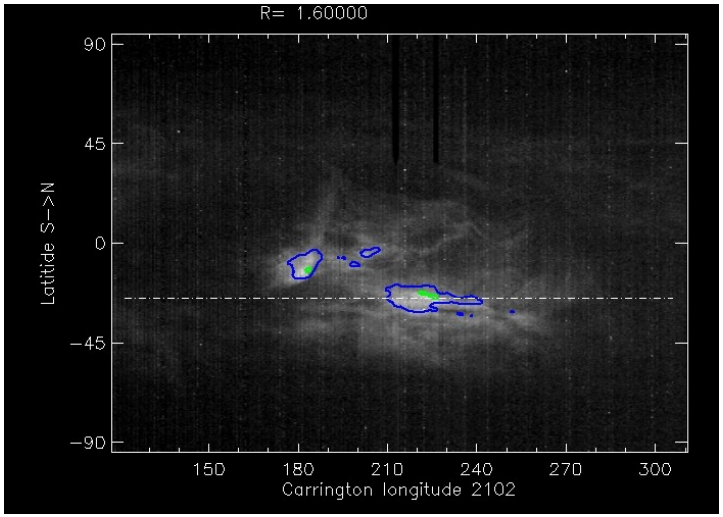
20 October 2010, CR 2102


R= 1.00000
90
45
0
−45
−90
Latitide S−>N
150
180
210
240
270
300
Carrington longitude 2102

LASCO C2: CR 2102

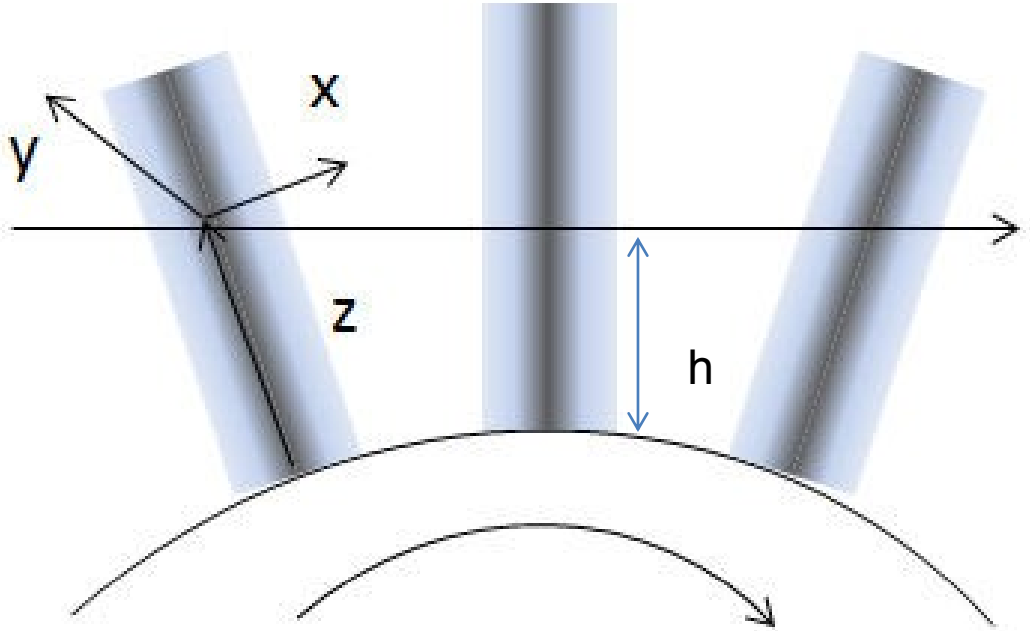


SWAP
R=1.6



N. Rich@NRL, 2012-04-03

Model of EUV streamer



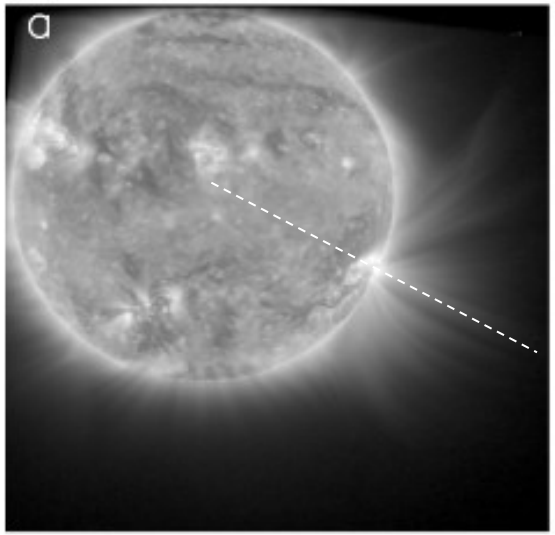
$$N_e(x,y,z) = R(z) * F_{||}(x) * F_{\perp}(y)$$

$$F_{||}(x) = \frac{1}{s_e\sqrt{2\pi}} \exp\left[-\frac{1}{2}\left(\frac{x}{s_e}\right)^2\right], \qquad s_e = f(z)$$

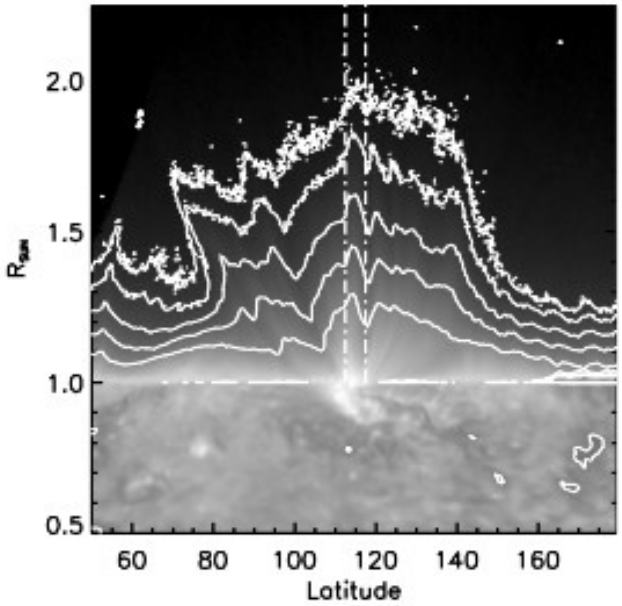
Guhathakurta_1996ApJ458
Thernisien_2006_APJ642

$$I \propto N_e^2, \qquad s_e = \sqrt{2} * s_b$$

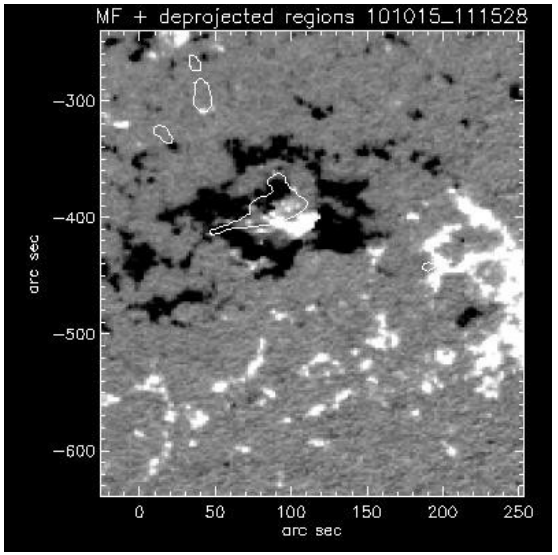
Original



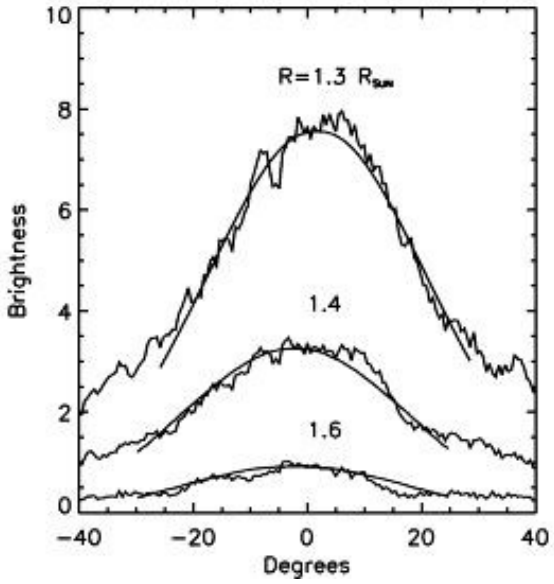
Polar image



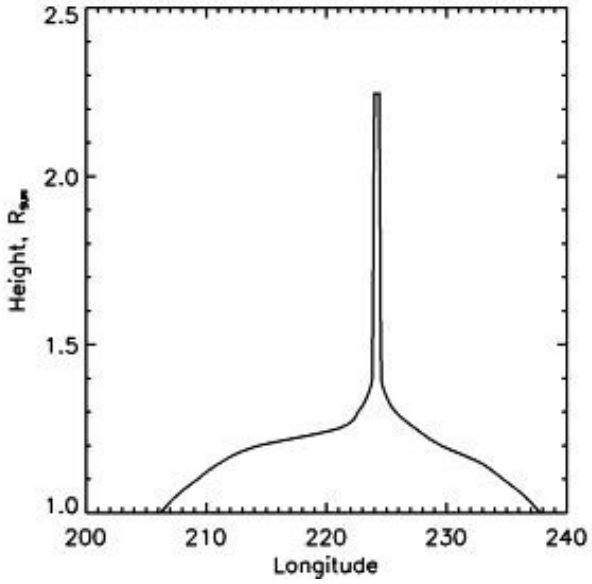
Magnetic field



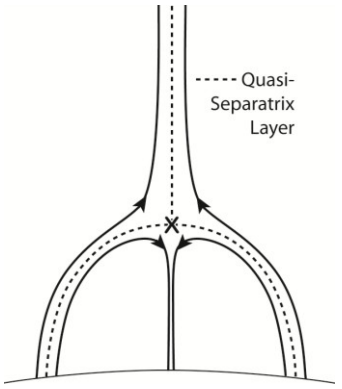
LOS radiance



EUV streamer (FWHM)



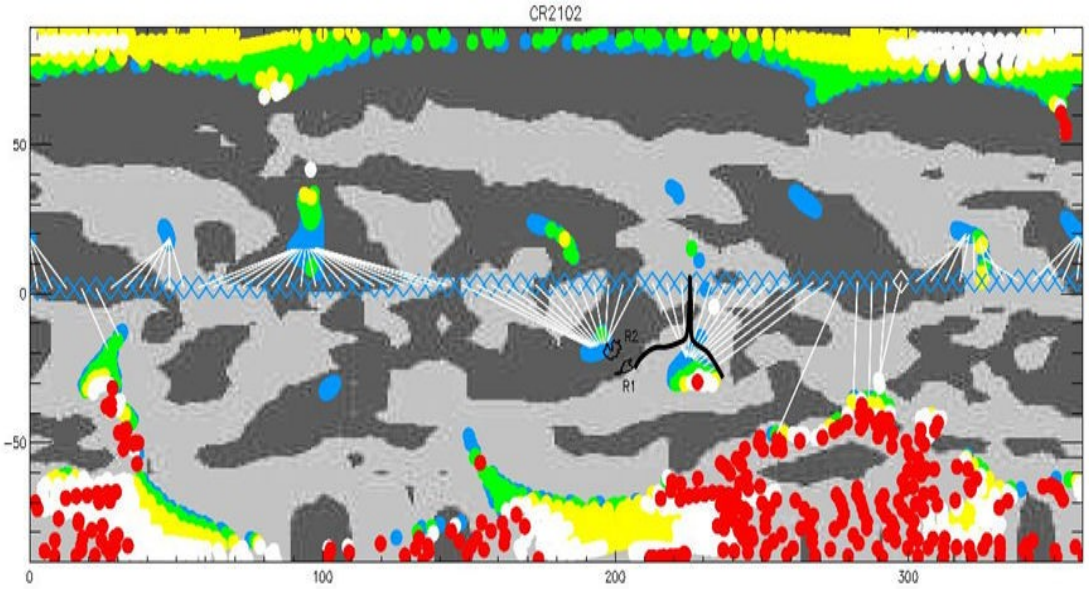
Pseudostreamer

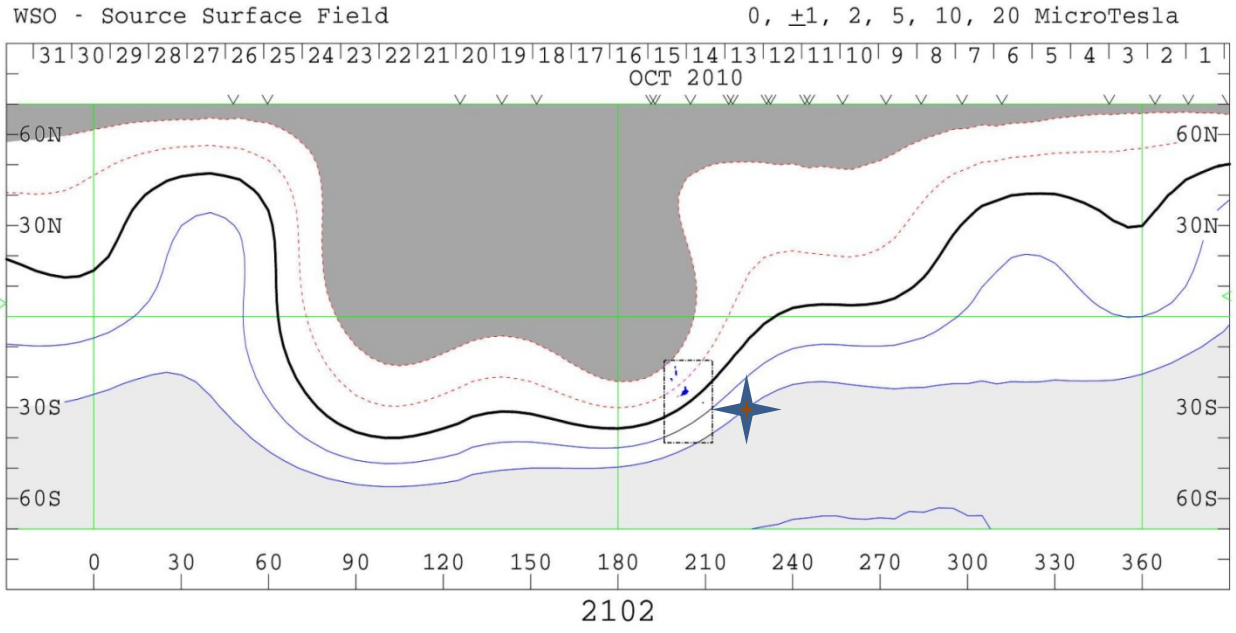


Wang et al. 2007, 2012,
Crooker et al. 2012

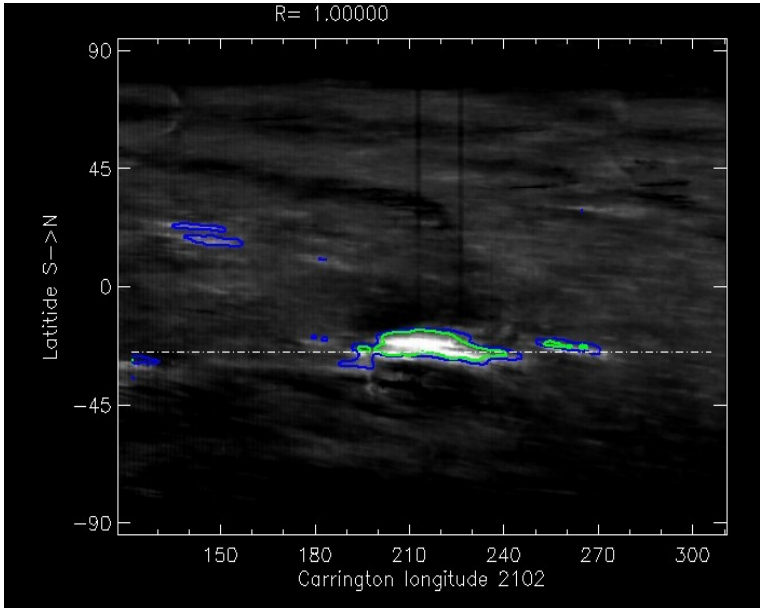
Even number of arcs with opposite direction of field

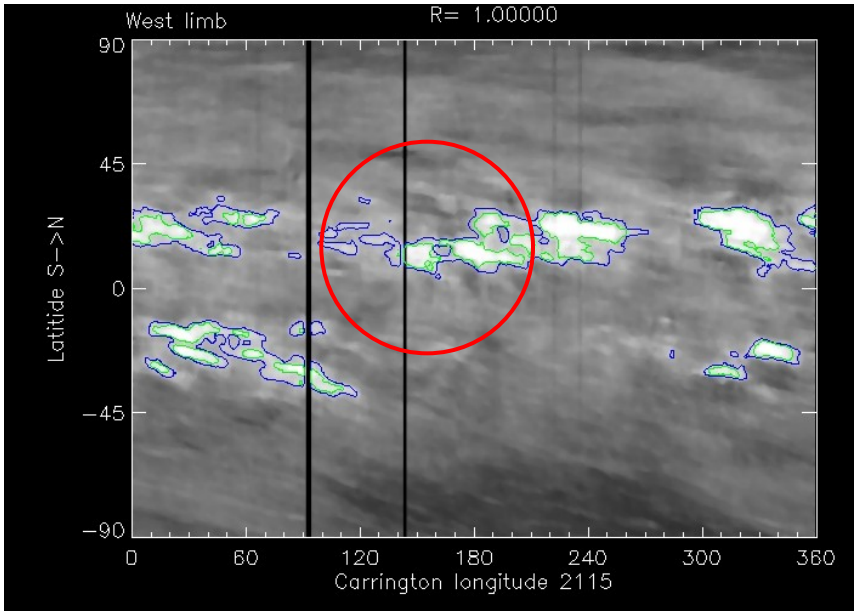
Location of the streamer at the WSA map of solar wind sources

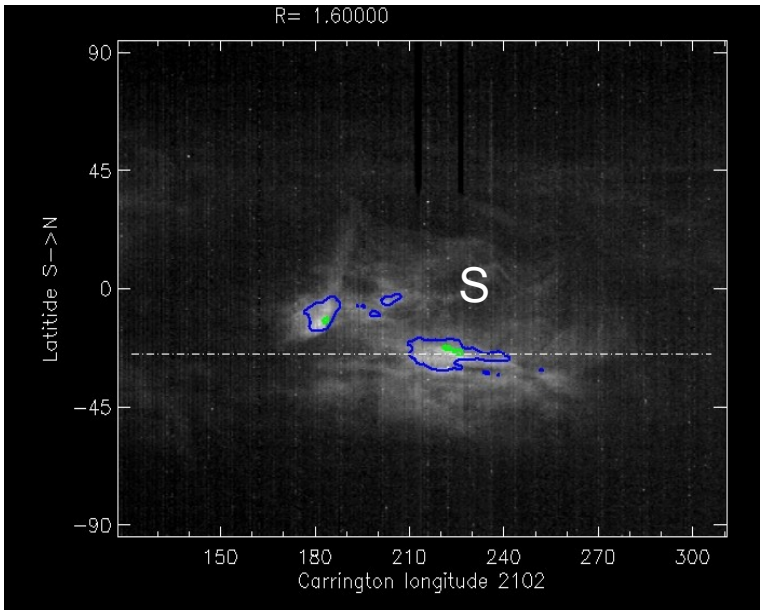


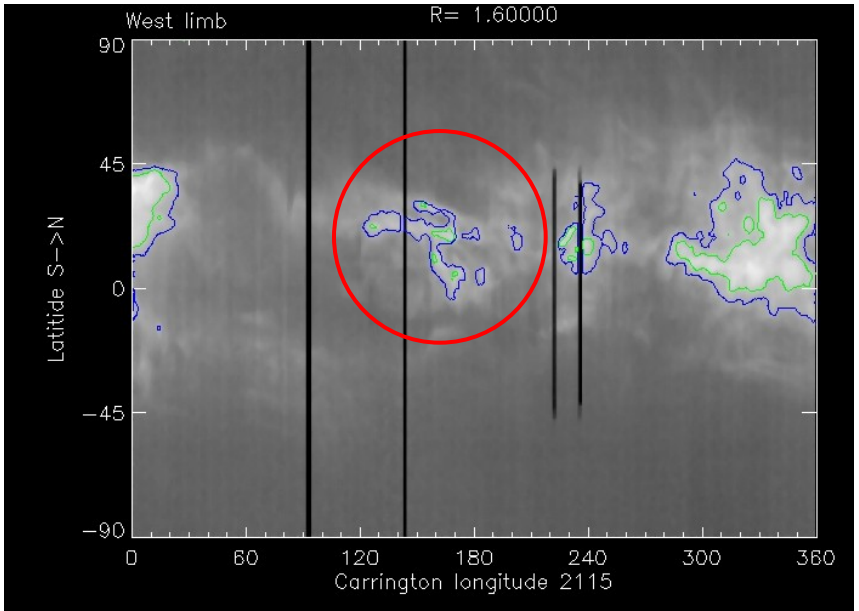


Variation of EUV streamers with solar activity









Conclusions

1. The brightest extended coronal structures seen in the 1MK spectral band (EUV streamers) are associated with outflows propagating along magnetic configuration of pseudostreamers.
2. Pseudostreamers seen in EUV become numerous when solar activity grows. Each PS originates from several local sources at the Sun merging in the corona at H>1.5 R_{sun}
3. Brightness at the EUV synoptic map is proportional to Ne^2 in contrary with WL streamers there it is ~ Ne, so EUV streamers look more contrast.