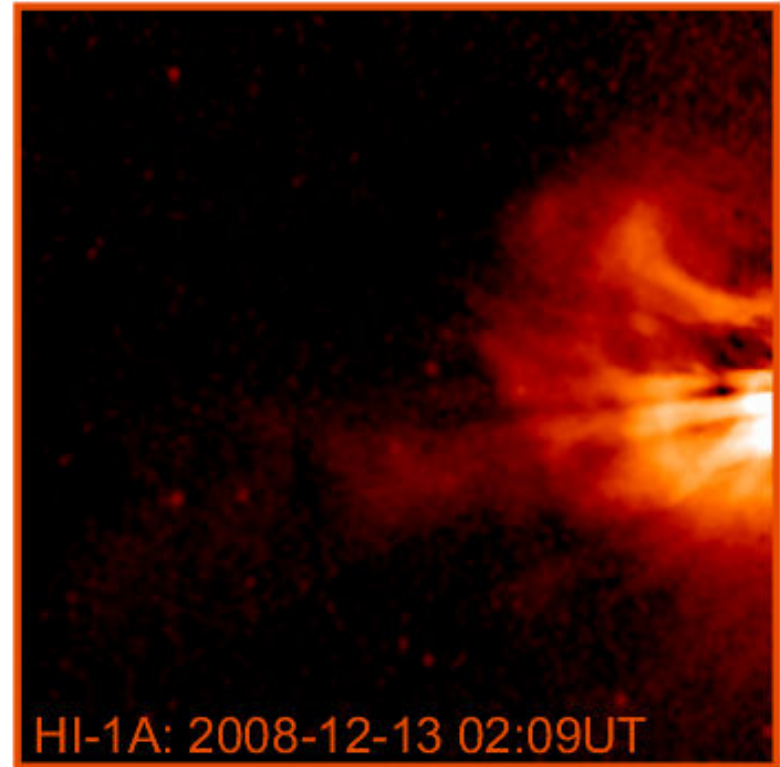
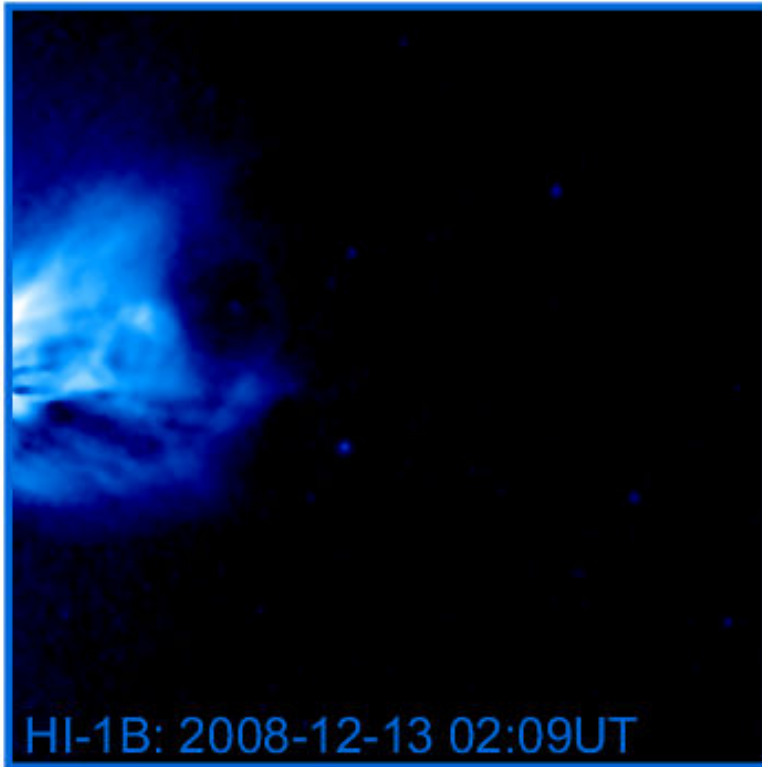


STEREO HI Post-Launch Support



Chris Davis

October 2009

HI-1 flatfield and photometric calibrations

- Have taken into account all available instrument response data –
 - Instrument-level and optics unit-level calibrations at CSL
 - Optics manufacturer's (ICOS) filter response data
 - CCD manufacturer's (e2v) QE data
 - Optical glass manufacturer's (Schott) transmission data
- Response to source spectrum $S(\lambda)$ predicted as –

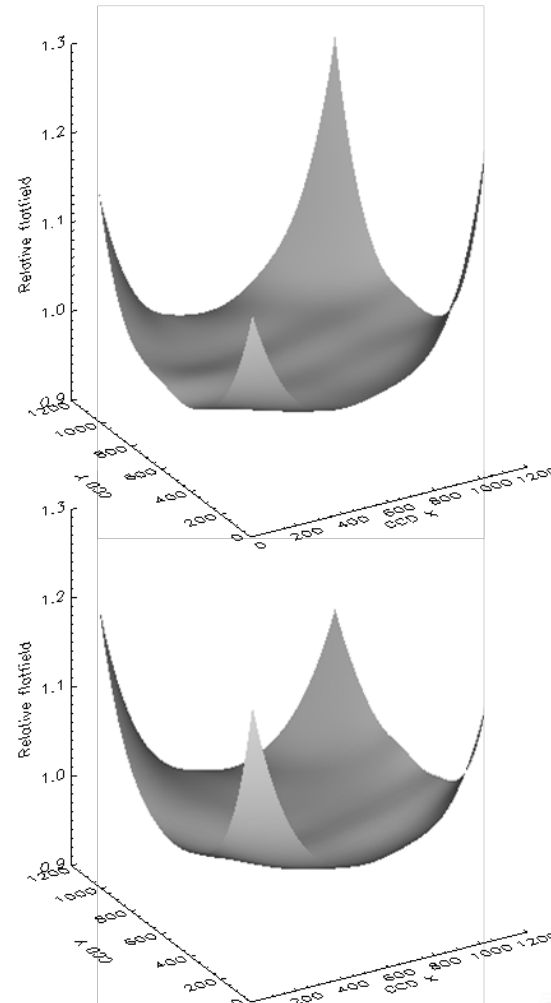
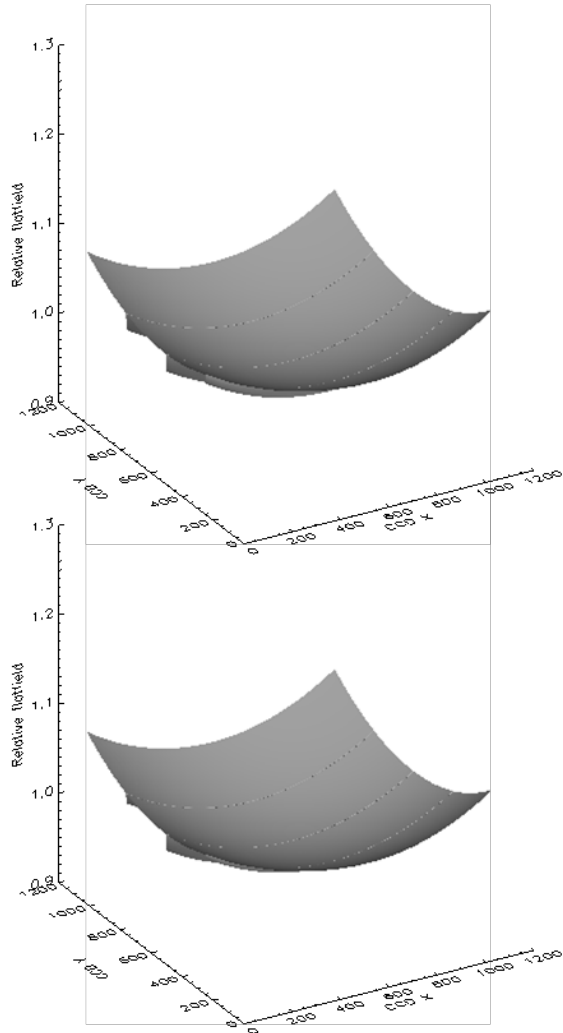
$$C_{pred} = (A/G) \int (\lambda/hc) S(\lambda) T(\lambda) QE(\lambda) d\lambda \quad (\text{in DN s}^{-1})$$

where A is aperture and G is CEB readout gain (e^- per DN)

Note: The term (λ/hc) is required because CEB response is determined by number of photoelectrons and not by energy flux. Some authors (other instruments) have neglected this!



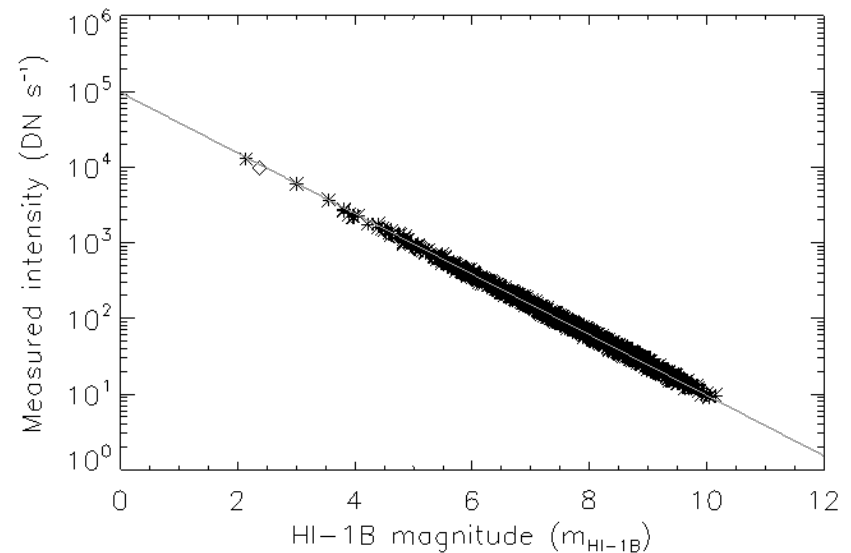
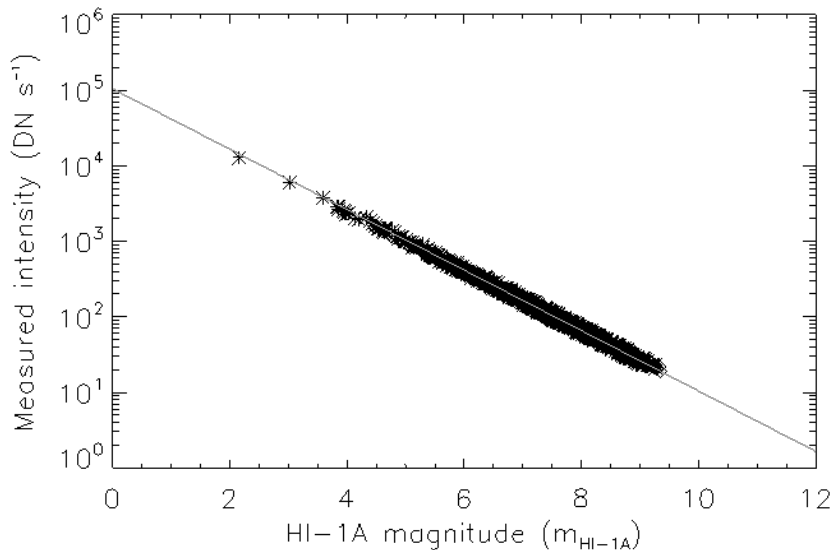
Results: Large-scale flatfield



Surface plots of pre-launch & optimised large-scale flatfield for HI-1A (top left & right) and HI-1B (bottom left & right)

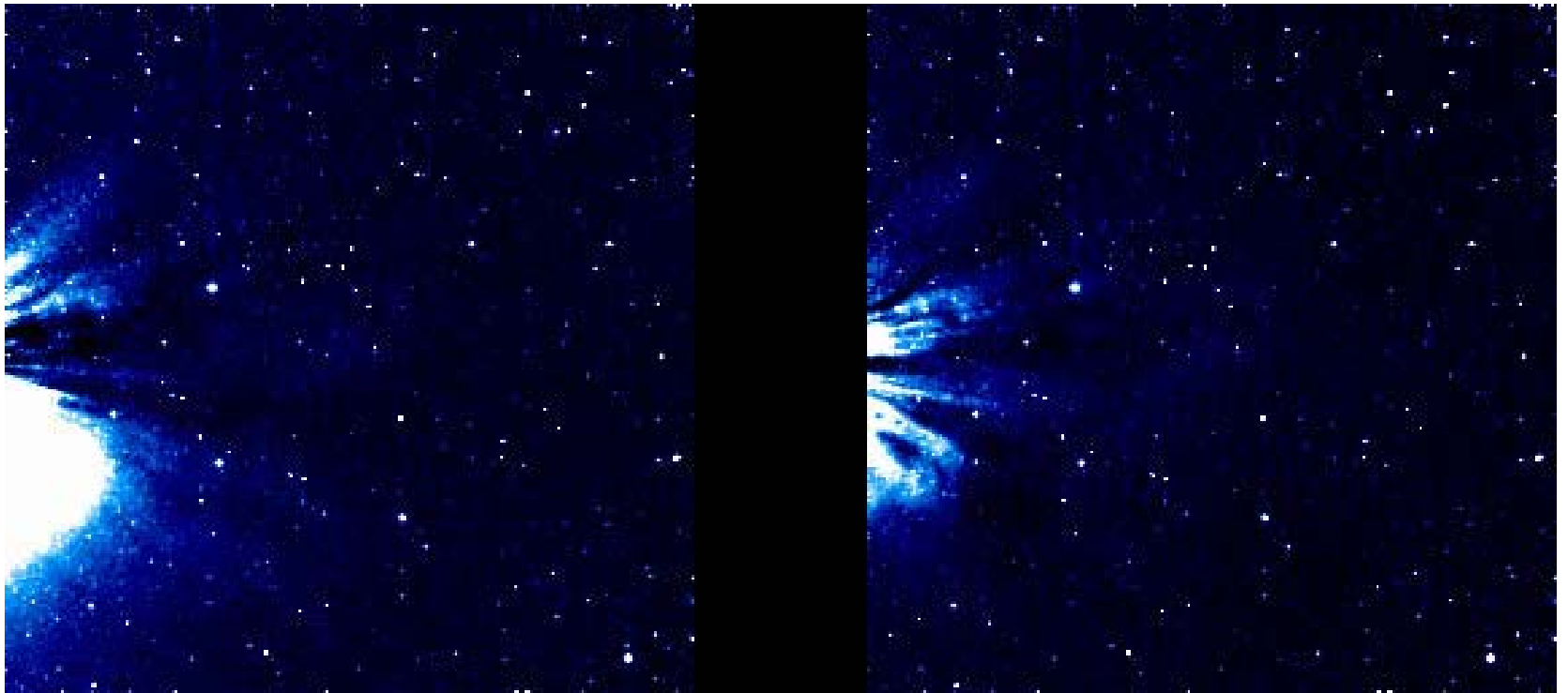
Results: HI-1 photometry

- Defined HI-1 magnitude scale for stellar-type objects –

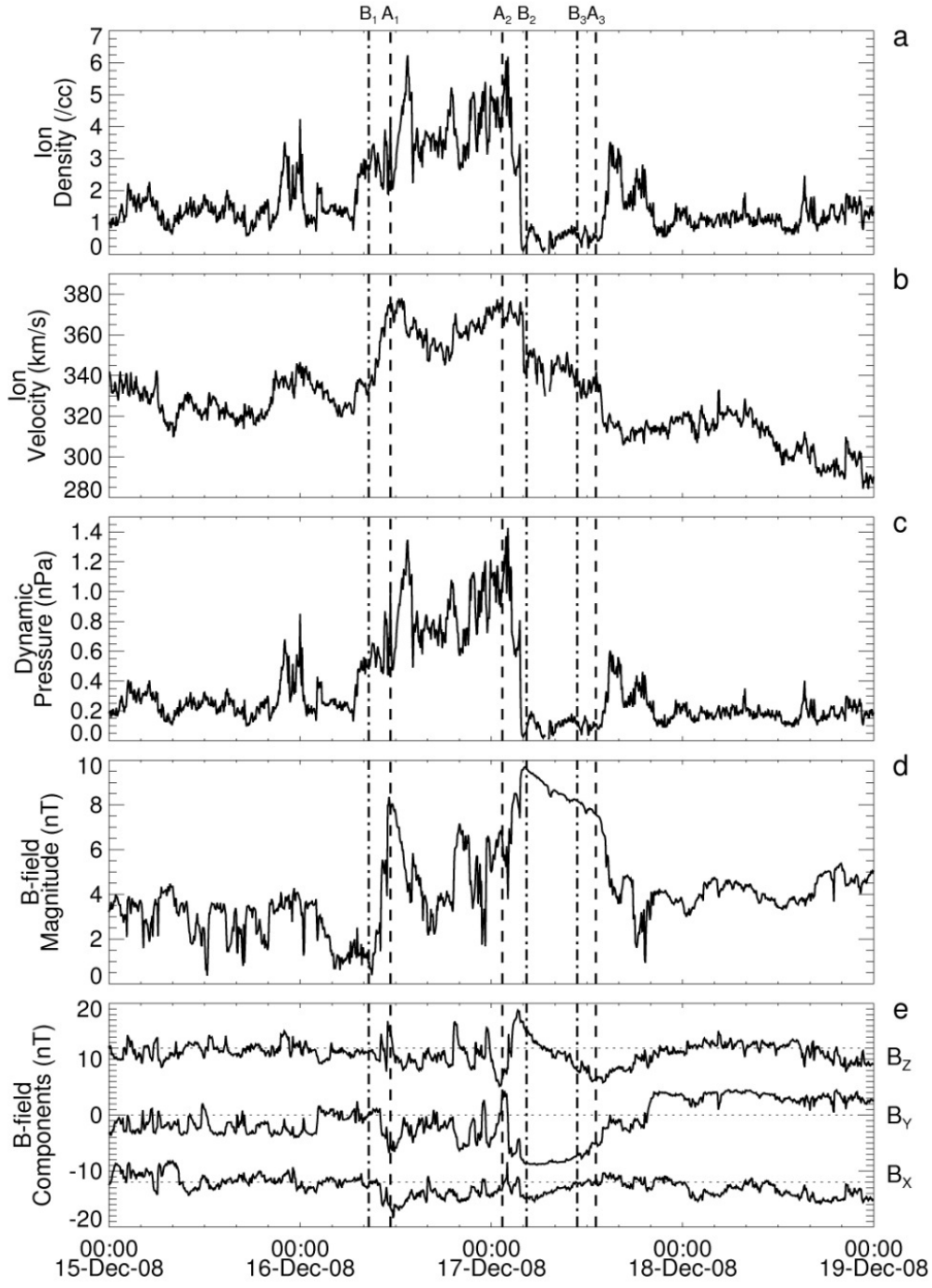


- Also conversion factors from DN s⁻¹ pixel⁻¹ to B₀ (mean solar brightness) and S10 units for diffuse emission regions.

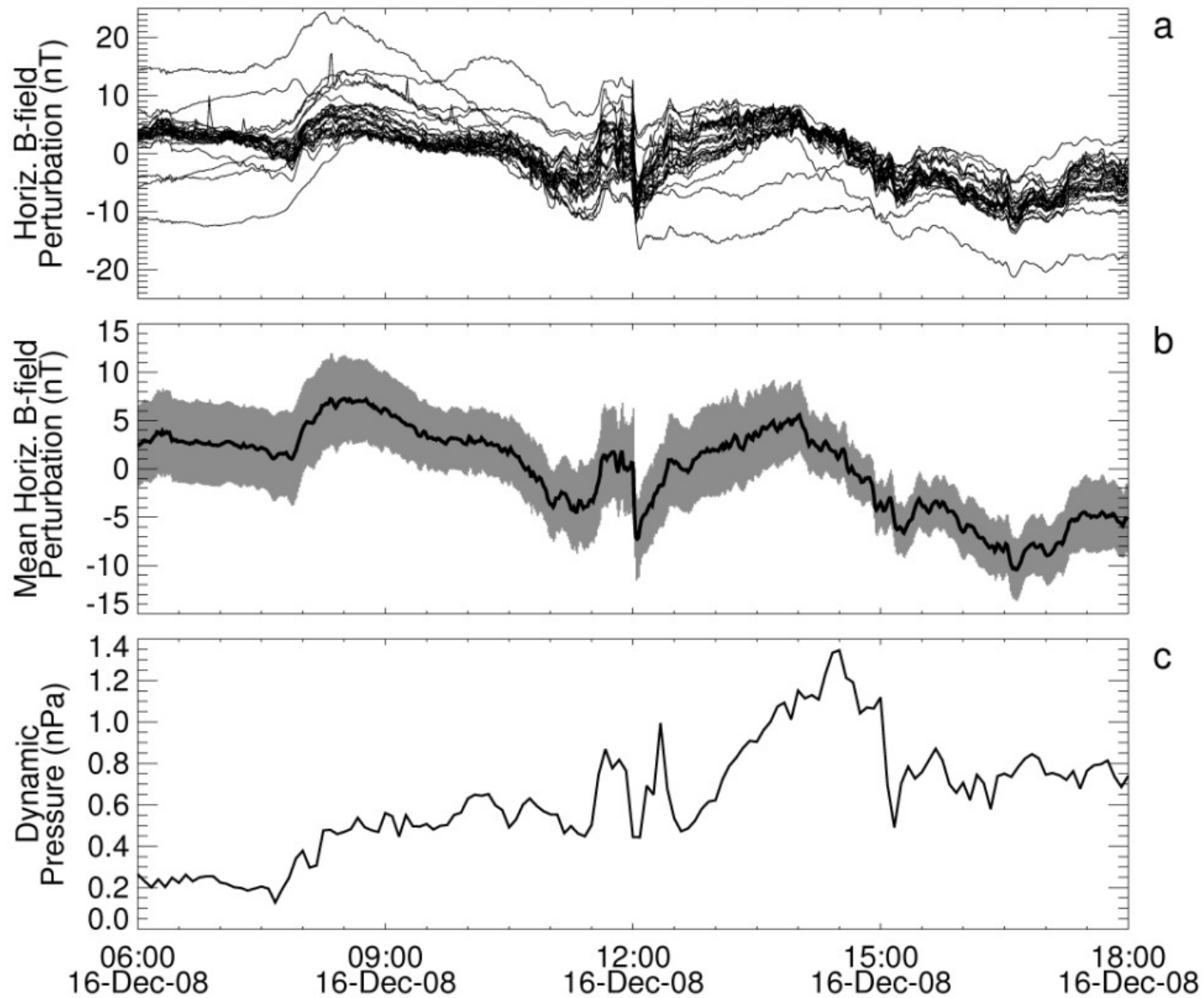
Accurate alignment using the starfield results in improved background subtraction in HI1B

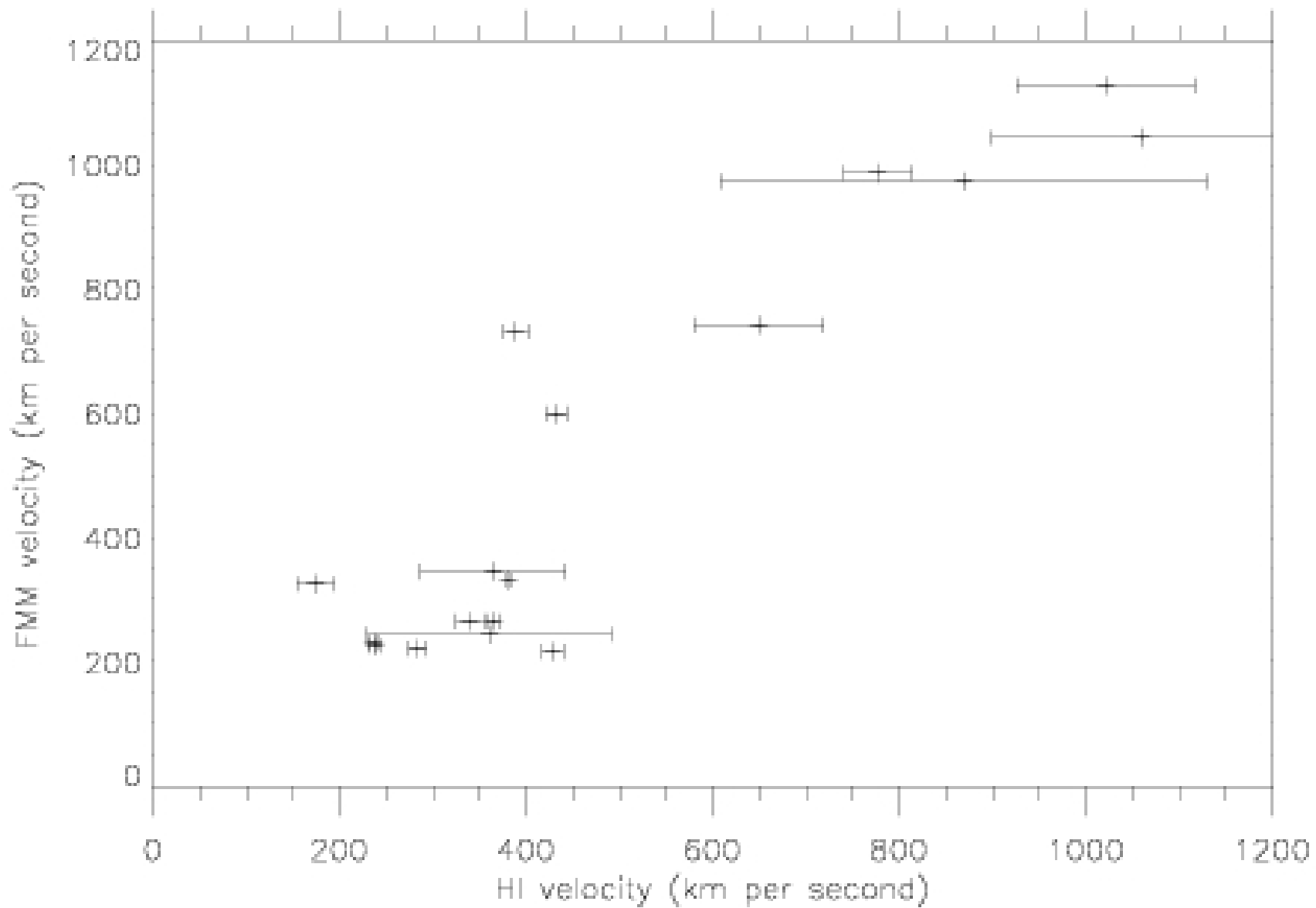


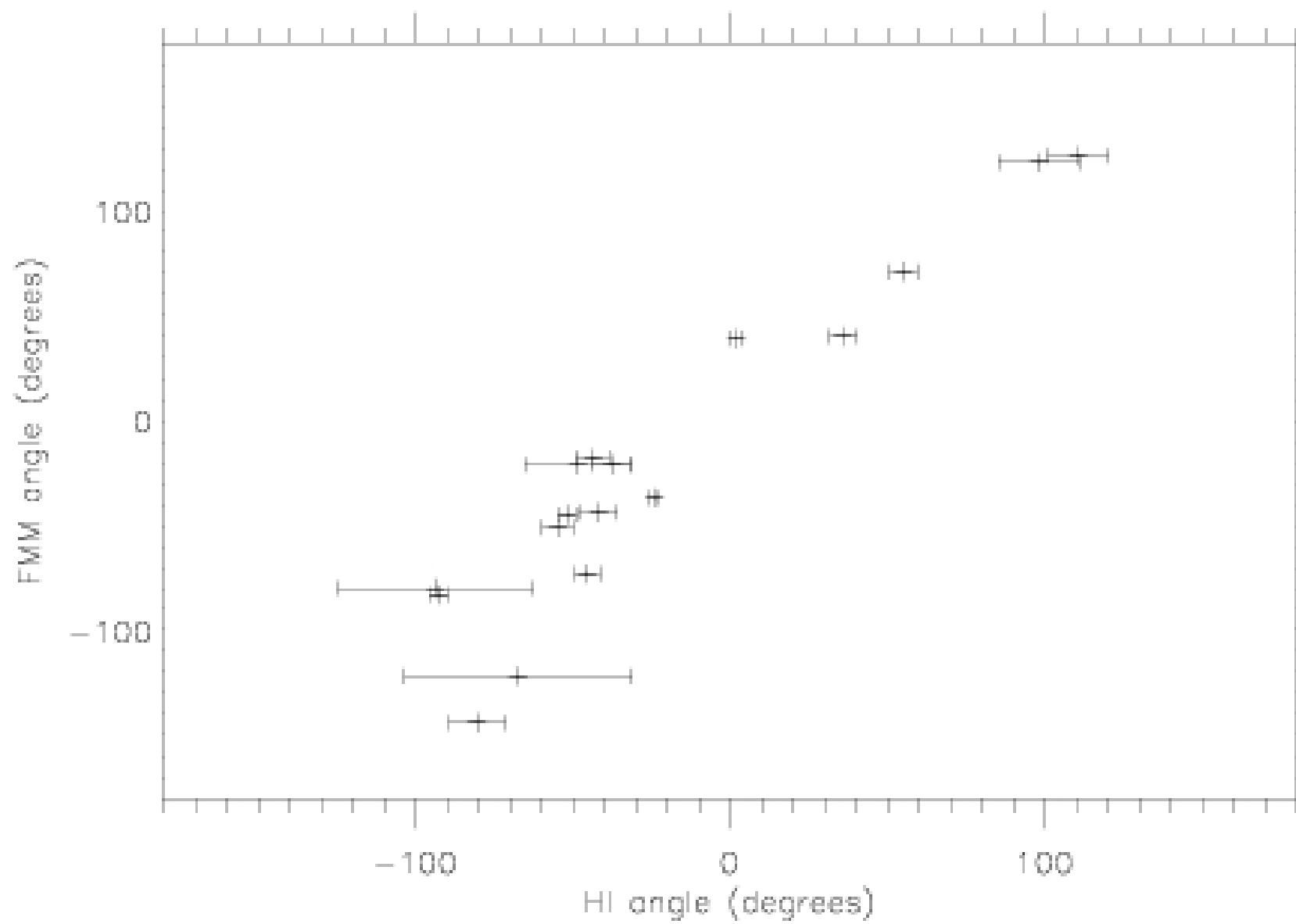
Davis et al, 2009

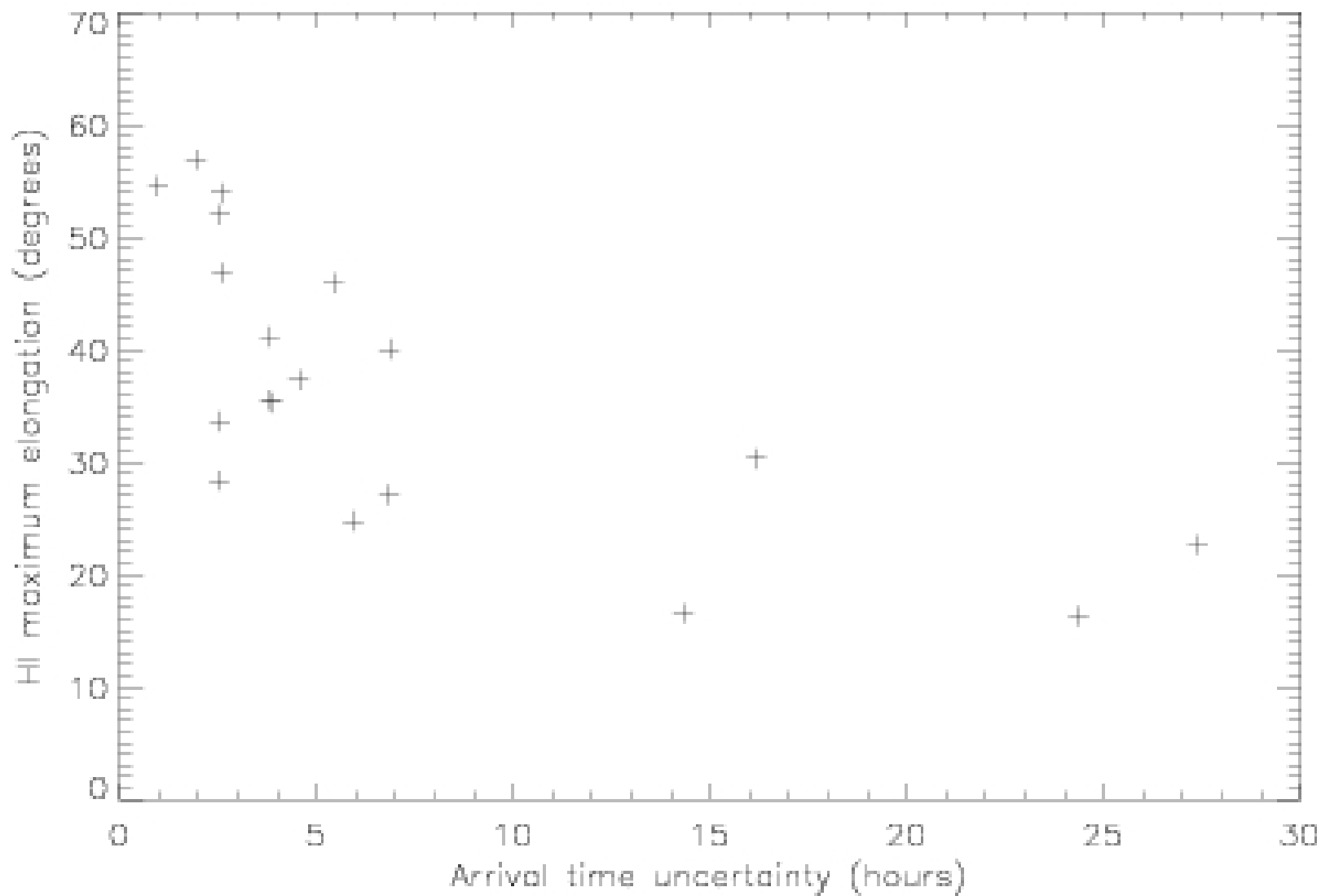


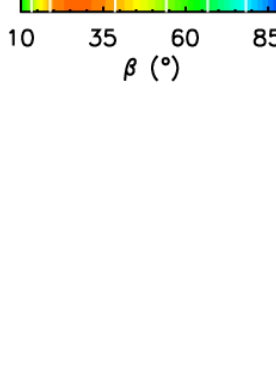
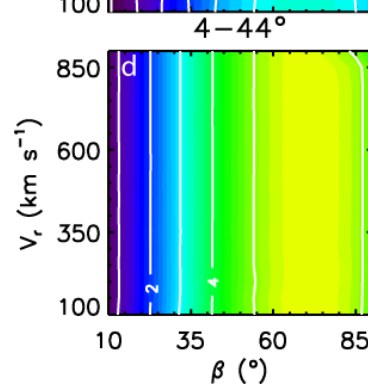
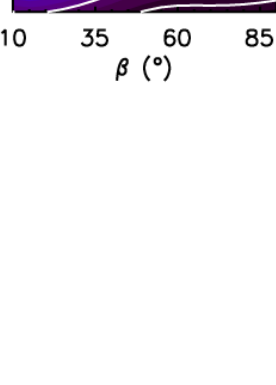
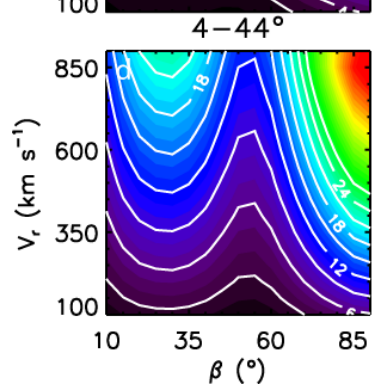
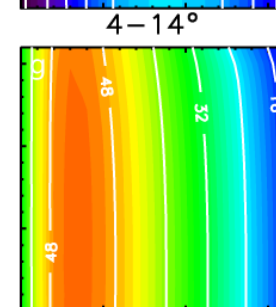
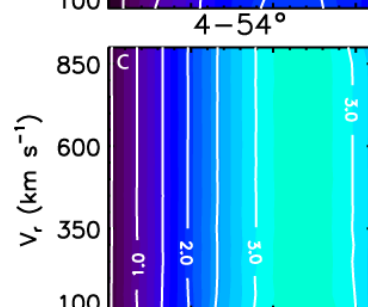
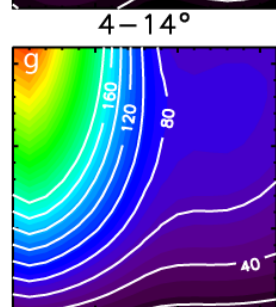
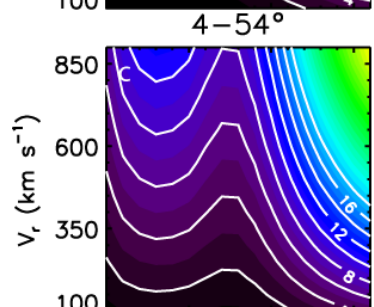
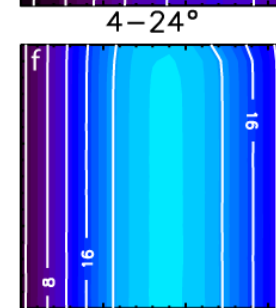
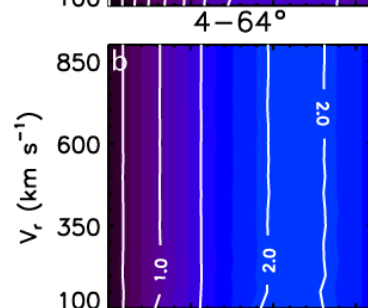
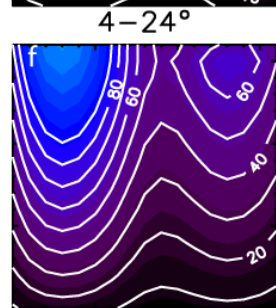
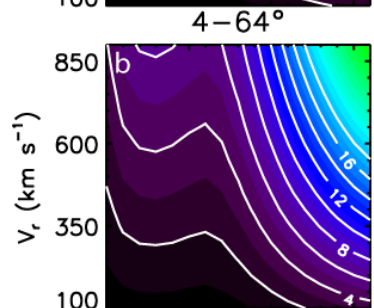
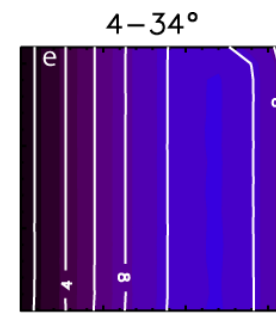
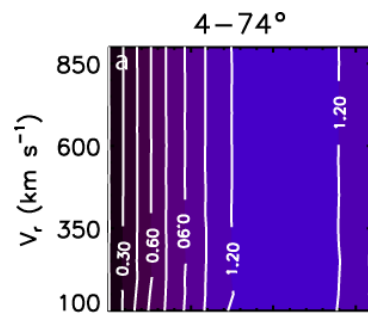
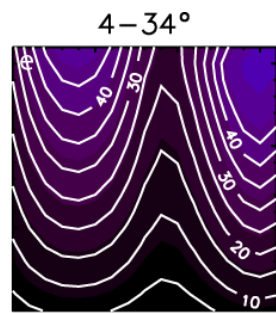
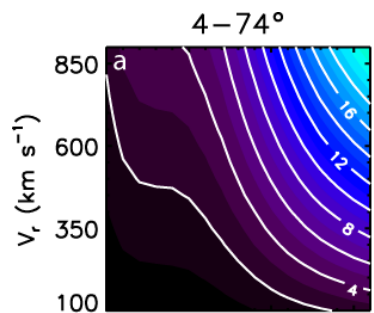
Davis et al, 2009





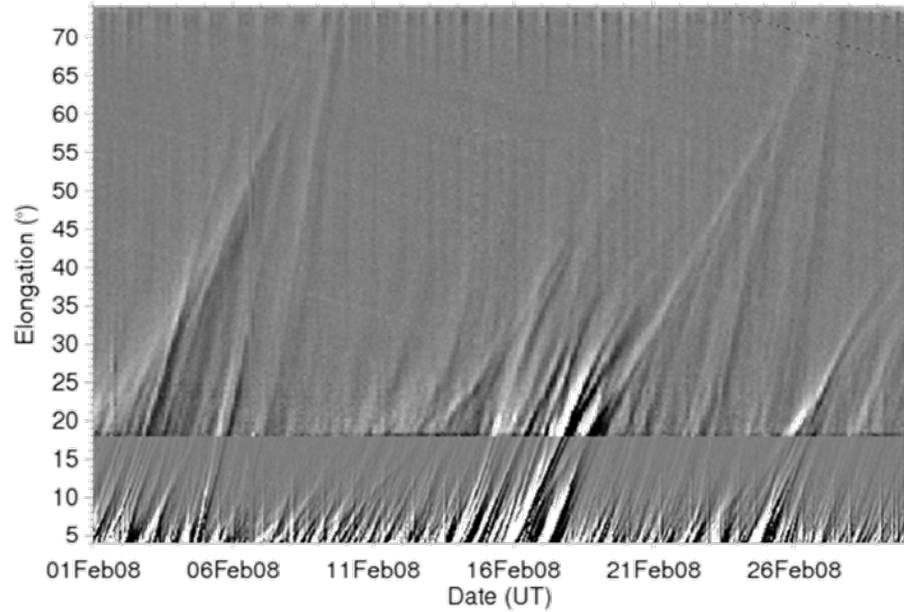






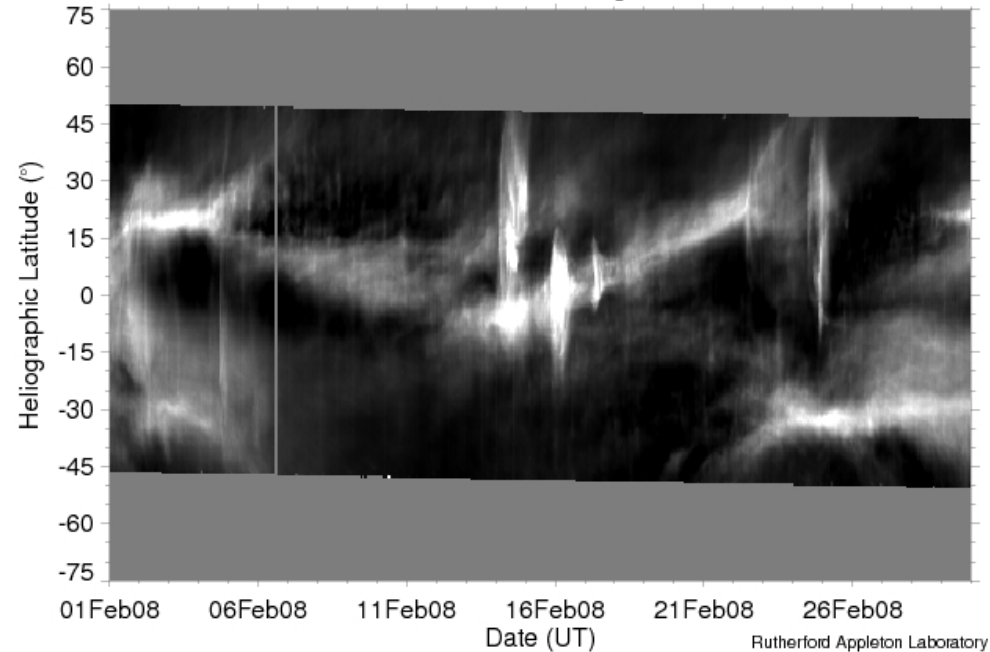
New data products

STEREO L2 DATA
HI-A

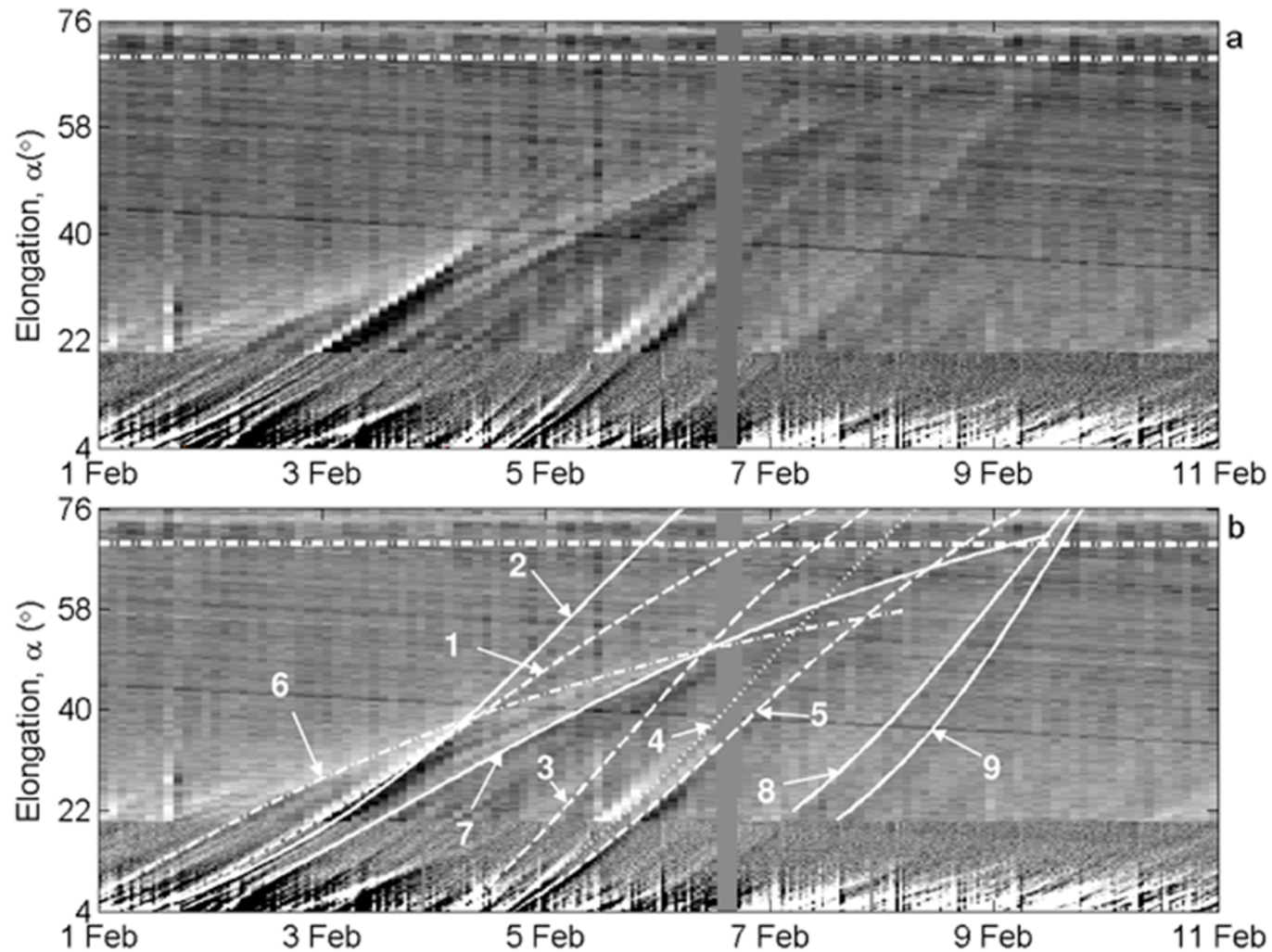


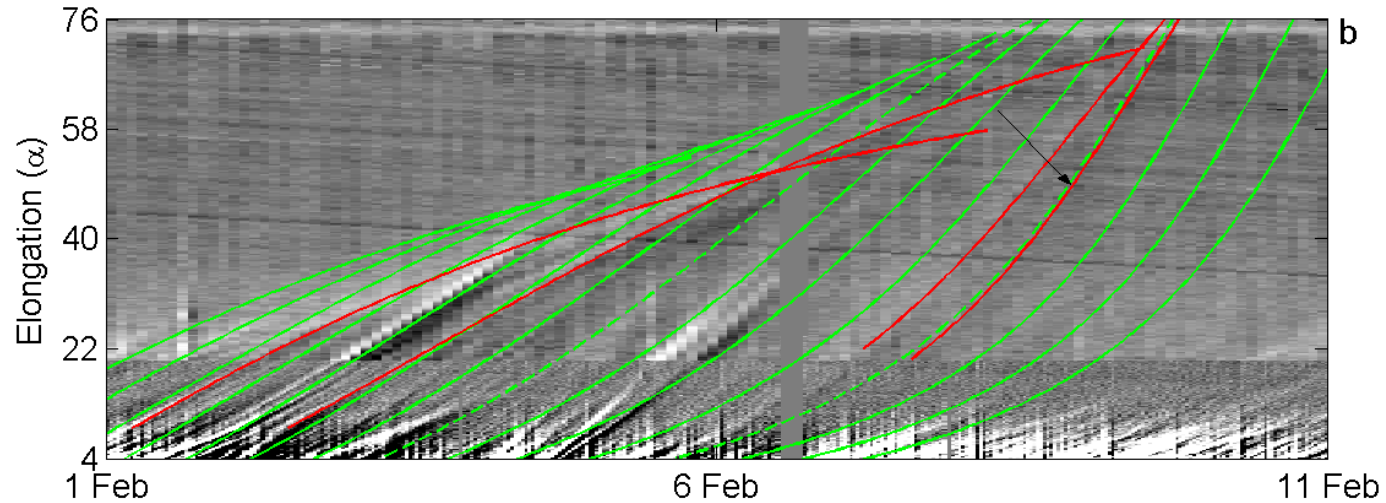
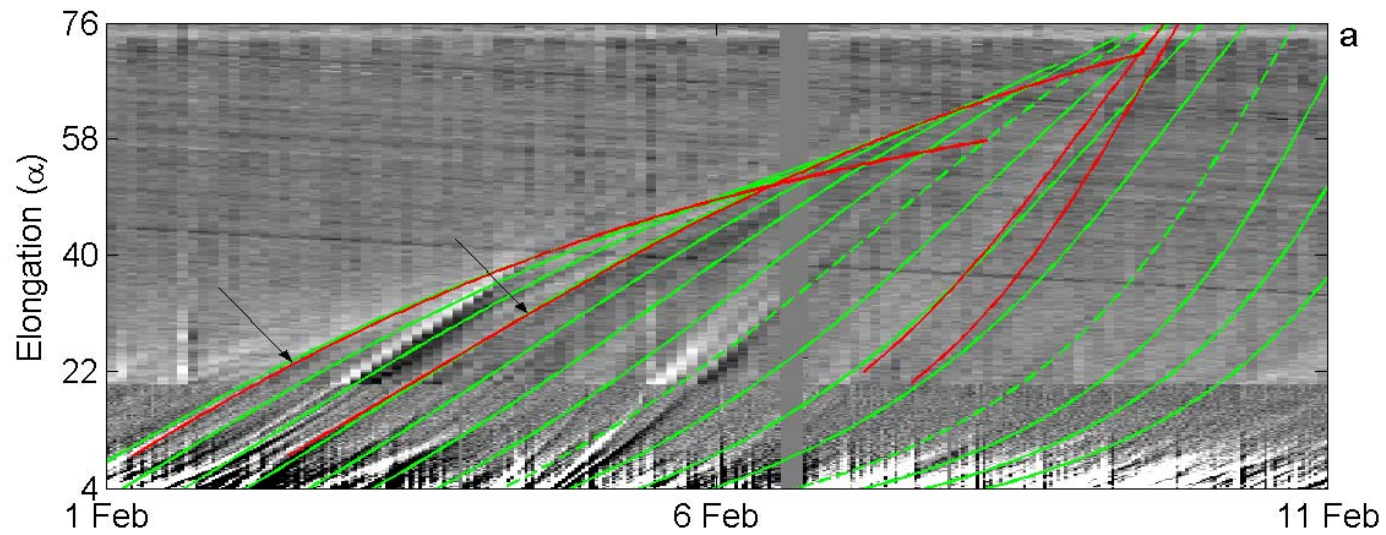
J-maps (elongation vs time)

STEREO Heliospheric Imager
HI-1A: 20R_s

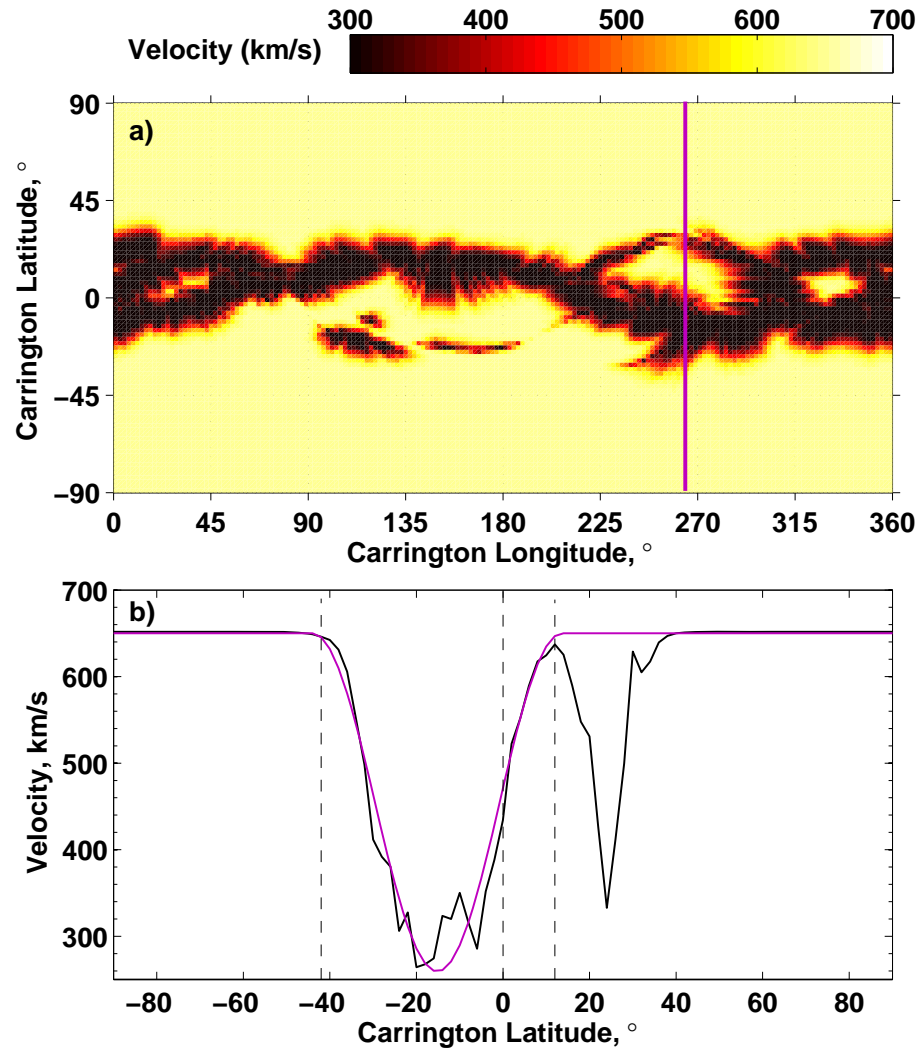
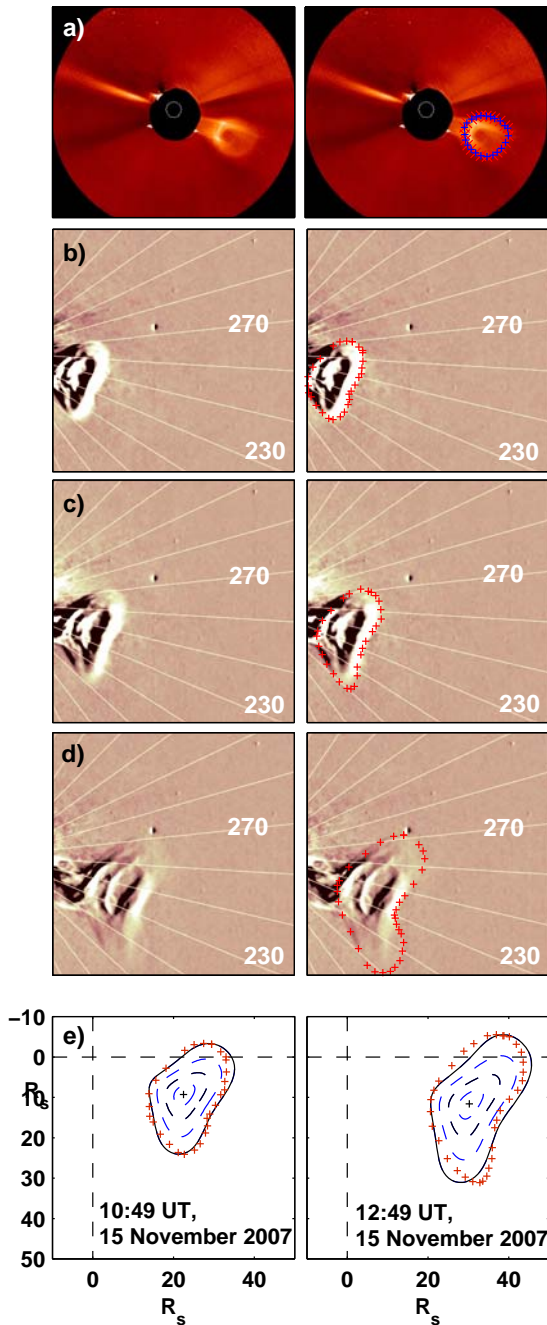


C-maps (latitude vs time)

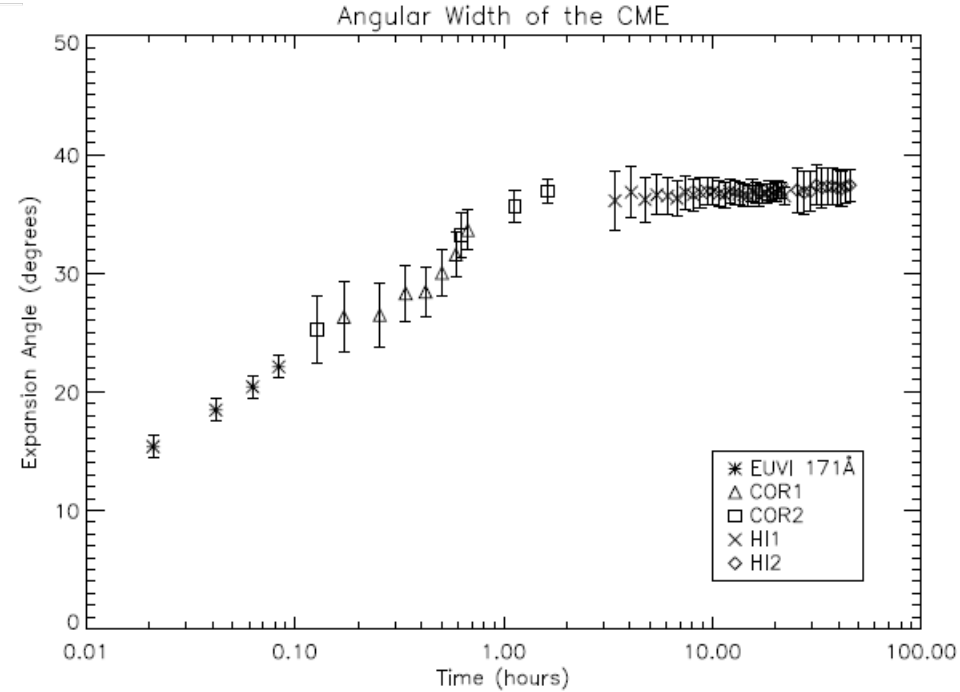
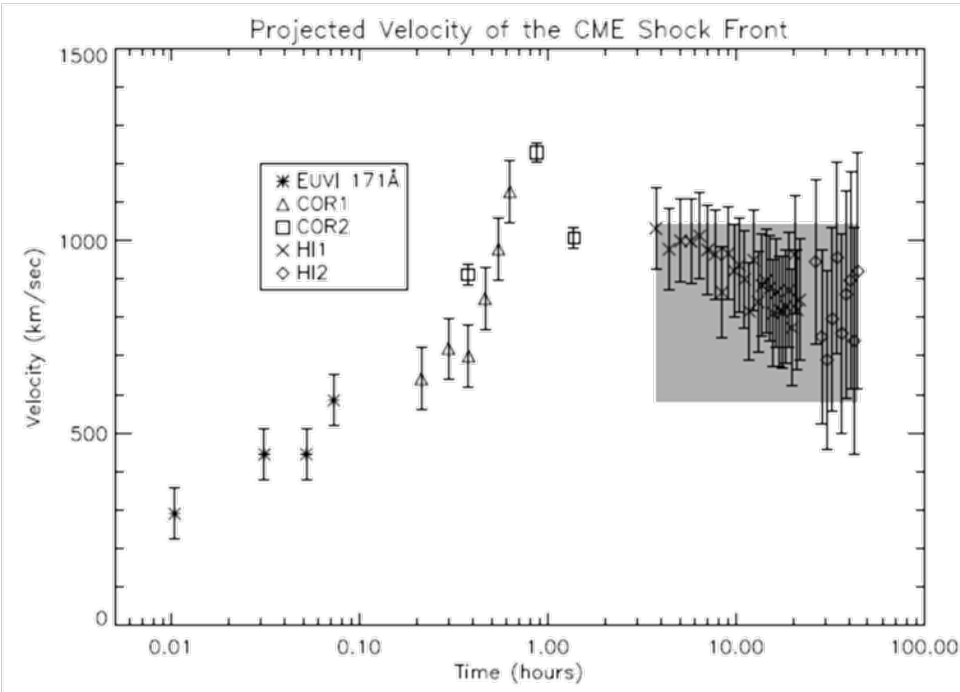
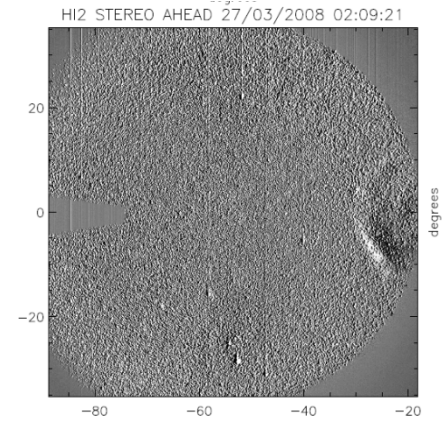
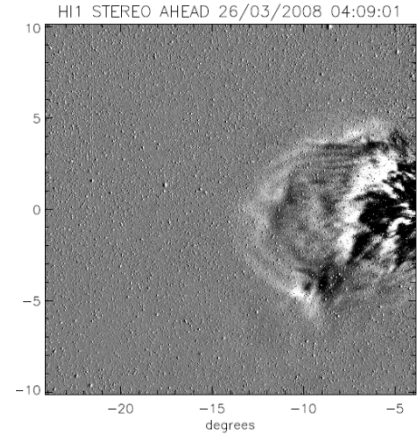
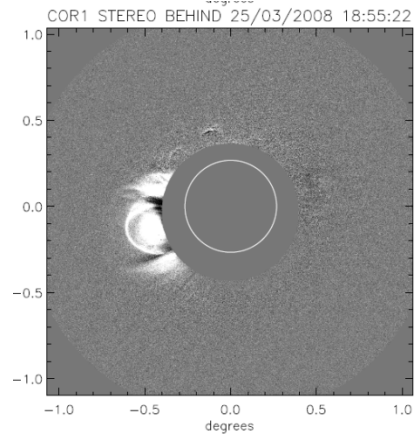
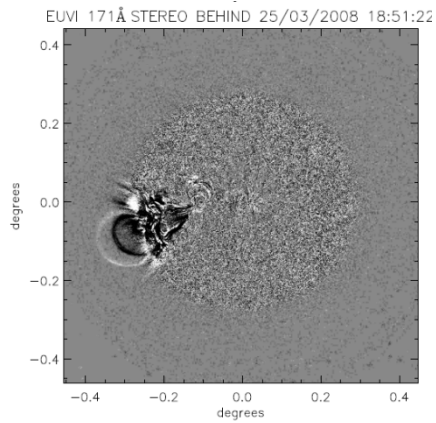




Savani et al, Observational evidence of a CME distortion directly attributable to a structured solar wind, Submitted to GRL, 2009.

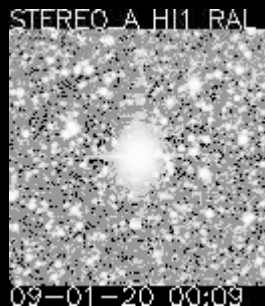


Savani et al, 2009 (in preparation)

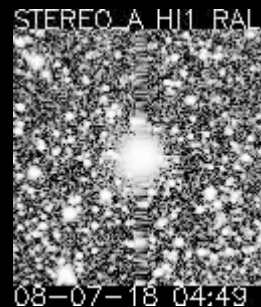




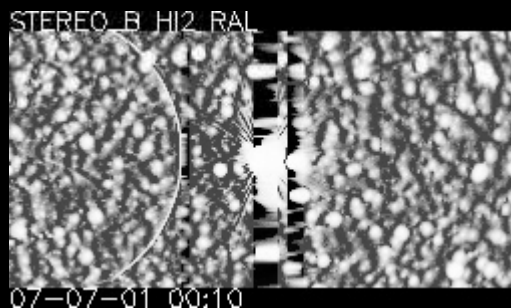
The Pleiades



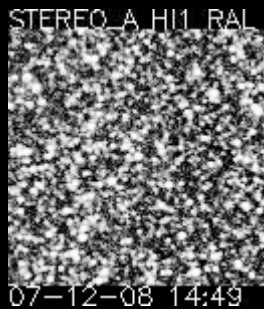
Mercury



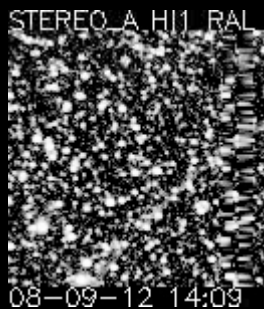
Mars



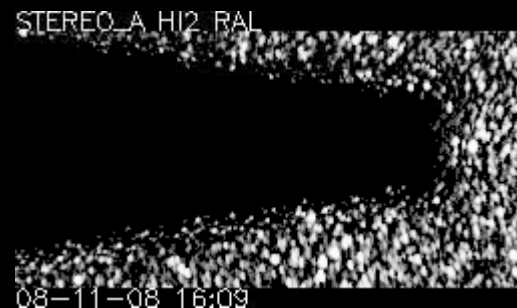
Earth and Moon



Vesta

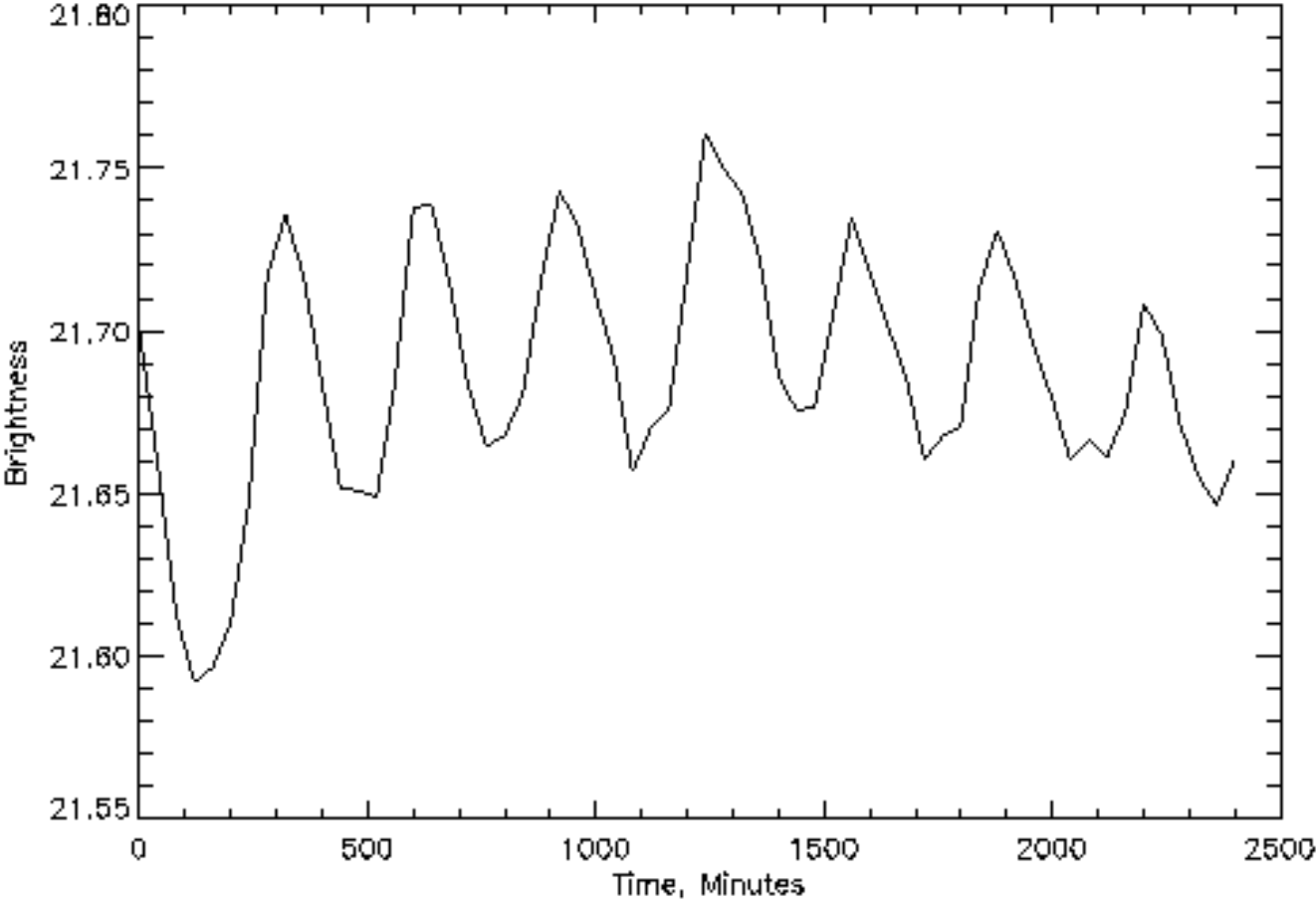
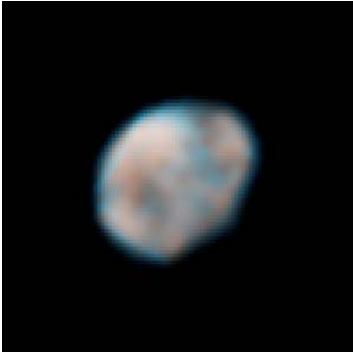


Astraea

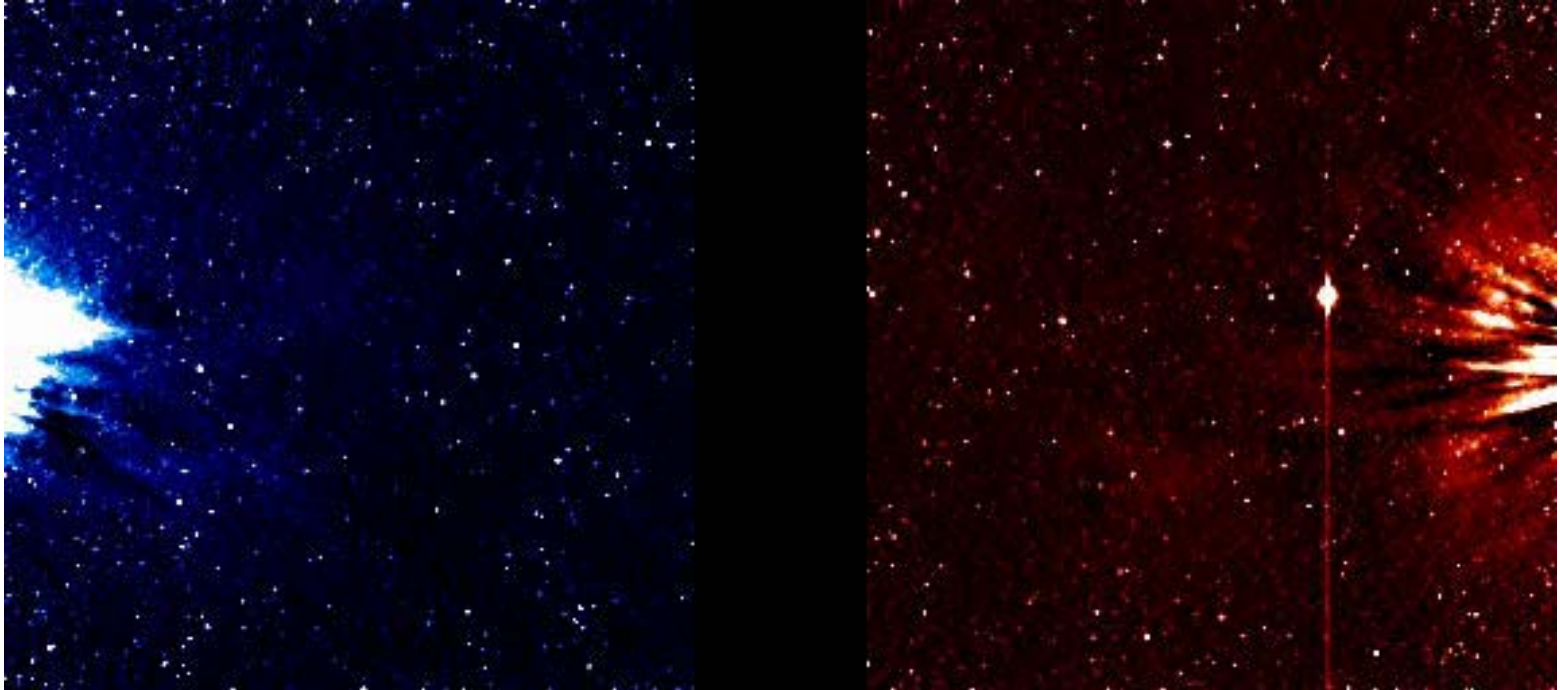


Uranus

Outreach project with a local school to produce light-curves for asteroids such as for Vega (below)



Solar Stormwatch – Outreach project with the Royal Greenwich Observatory



HI data has been used by UK artists Semiconductor in a film that is being exhibited in galleries world-wide and on the web – bringing STEREO to the attention of the arts community

