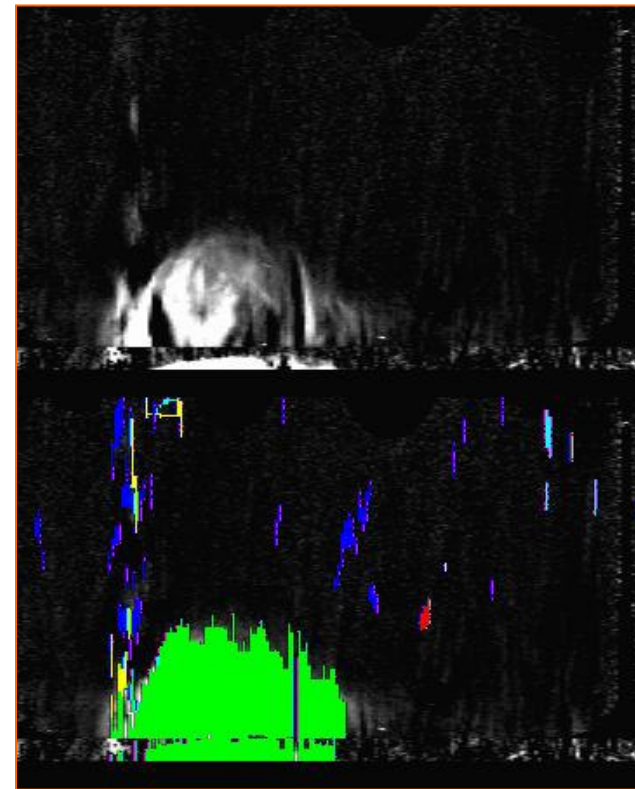
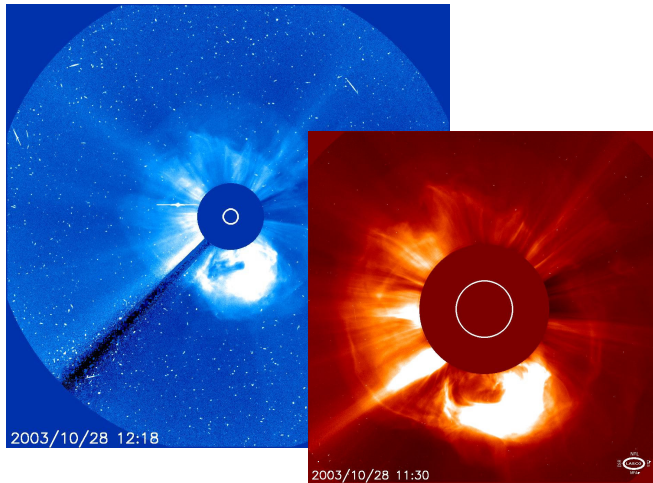


CACTus performance on STEREO beacon-data

Eva Robbrecht
David Berghmans

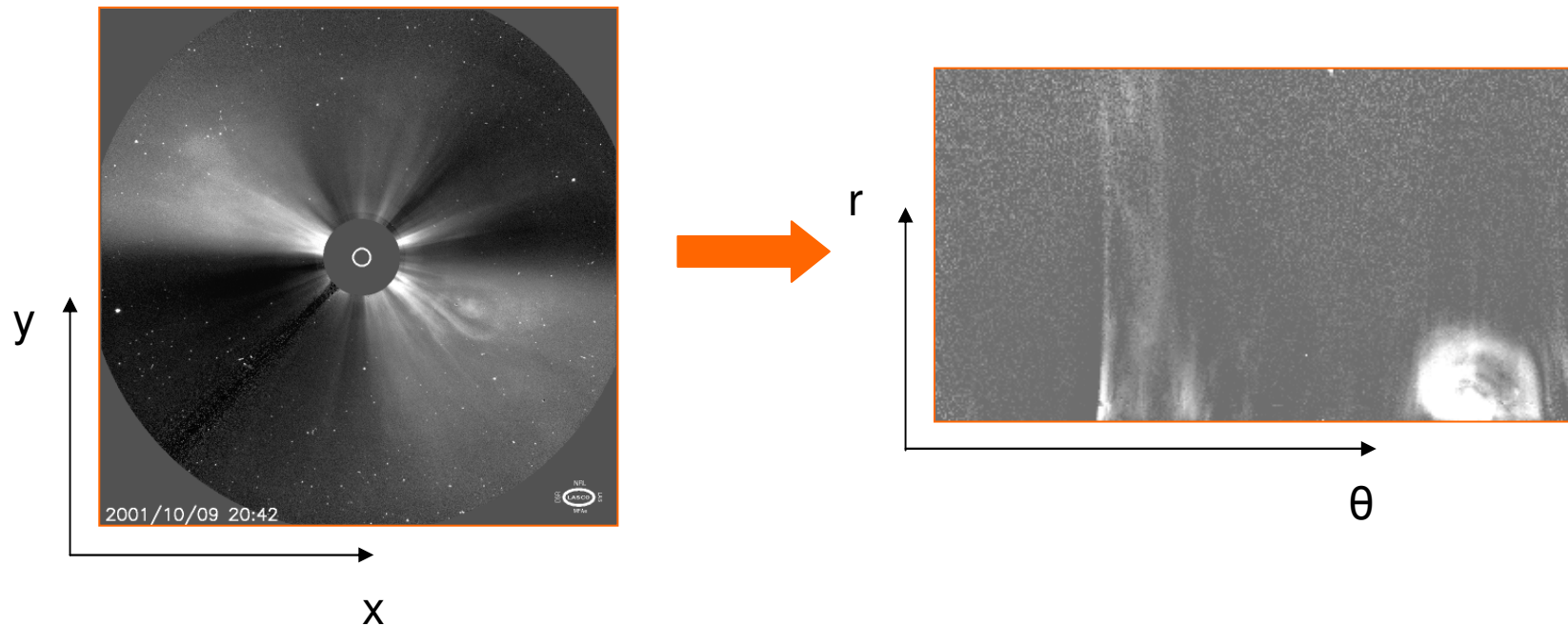
1. The method

- ✓ Preprocessing
- ✓ CME extraction
- ✓ Output parameters

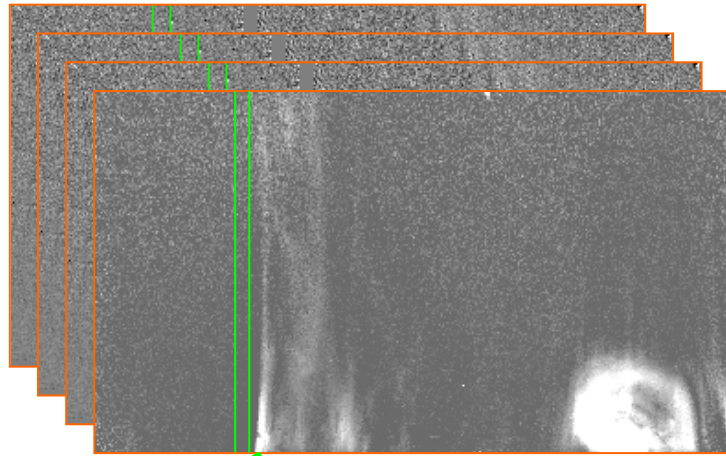


Preprocessing

- Data: C2/C3
- Cleaning: cosmic rays, exposure time correction
- Polar transformation: $[x,y] \rightarrow [\theta,r]$
- Take running difference and rebin



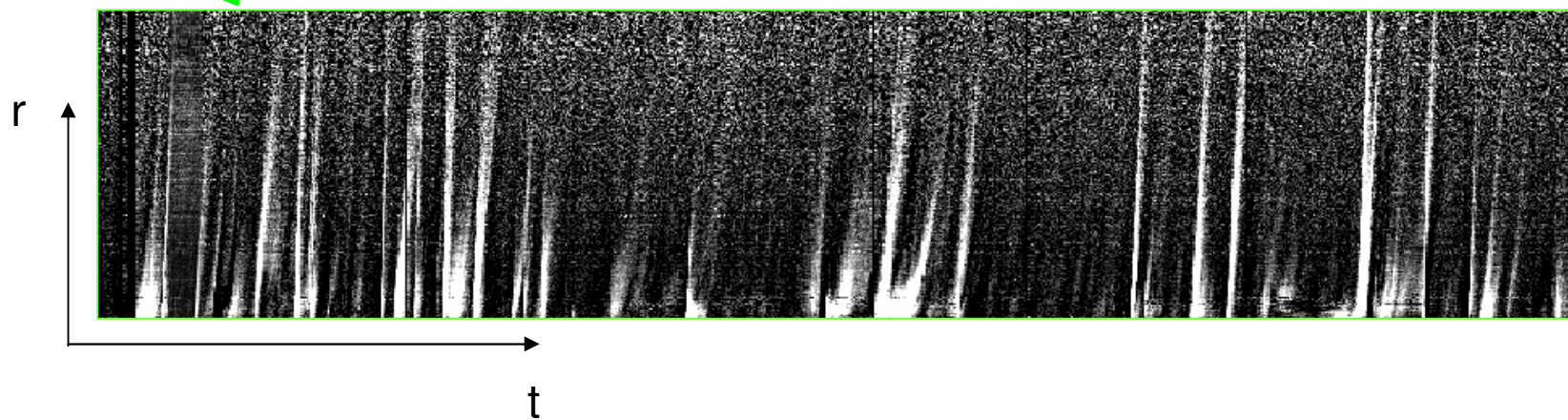
Preprocessing



$[\theta, r]$ for each t



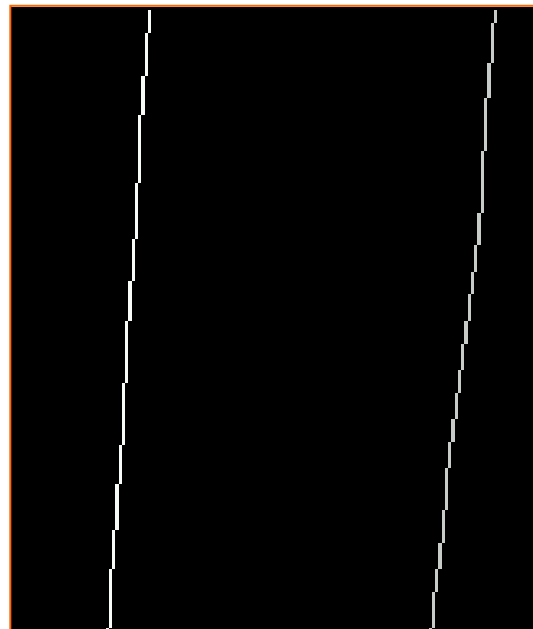
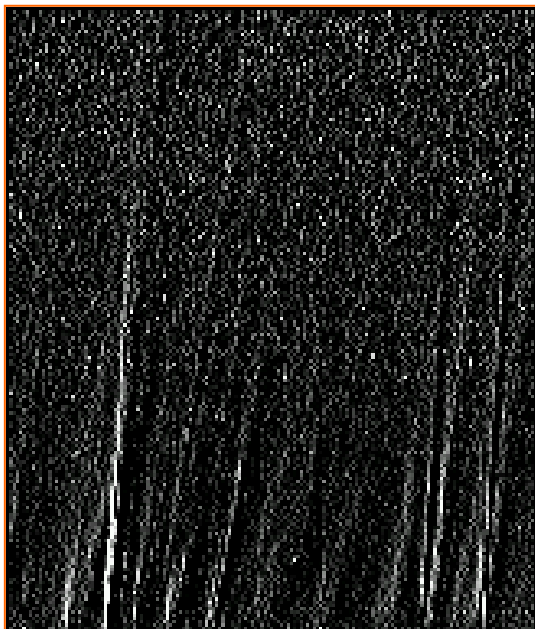
$[t, r]$ for each θ



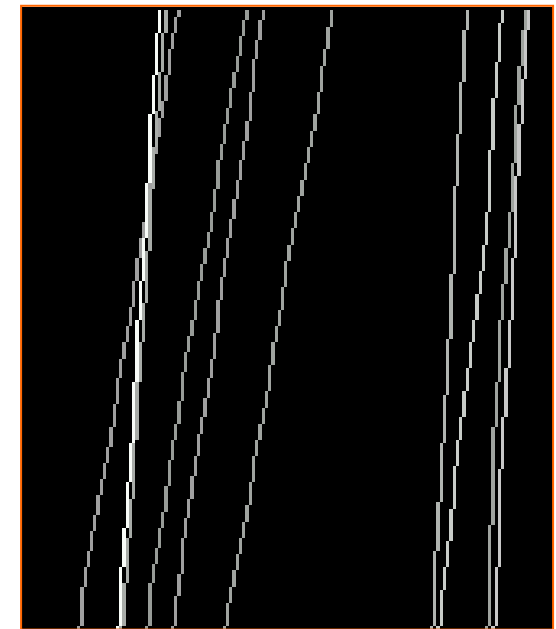
CME extraction

- CME signal \cong straight line
- Method: Hough transform

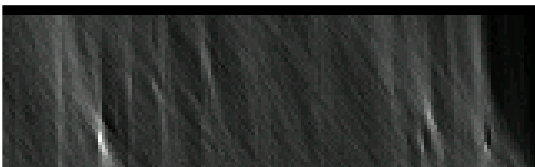
Based on integration of intensity along the straight line



After 2 iterations



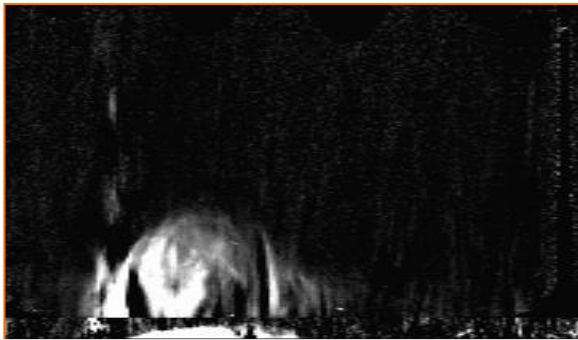
After n iterations ...



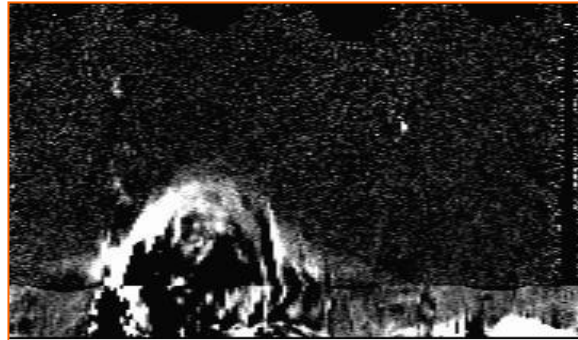
Hough space

CACTus output

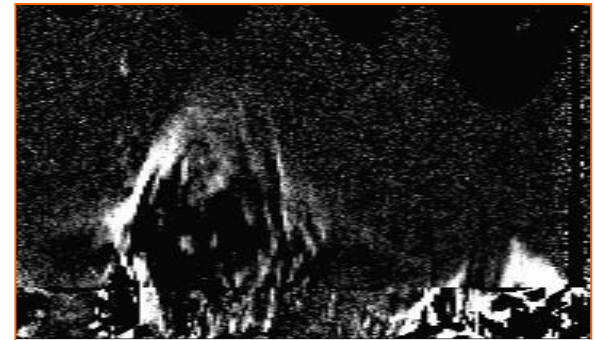
11 November 2003



15h18



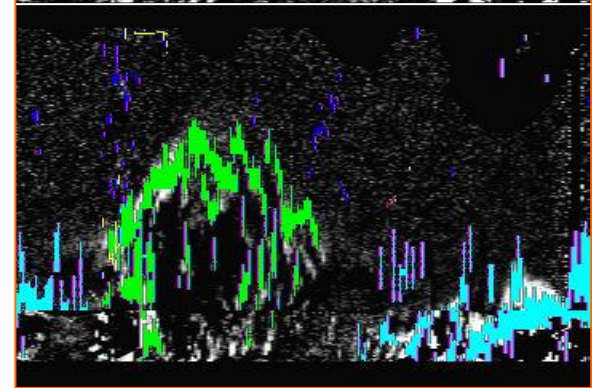
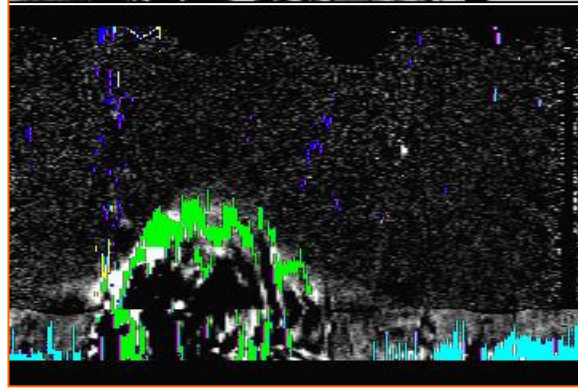
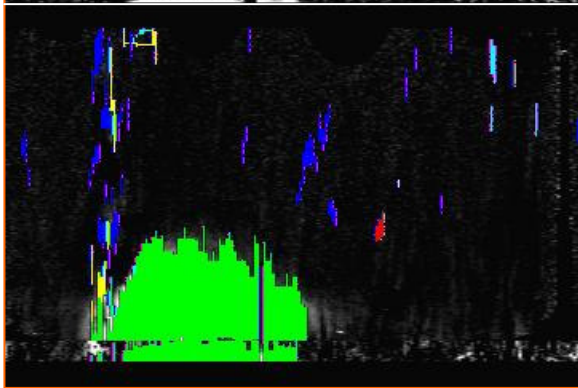
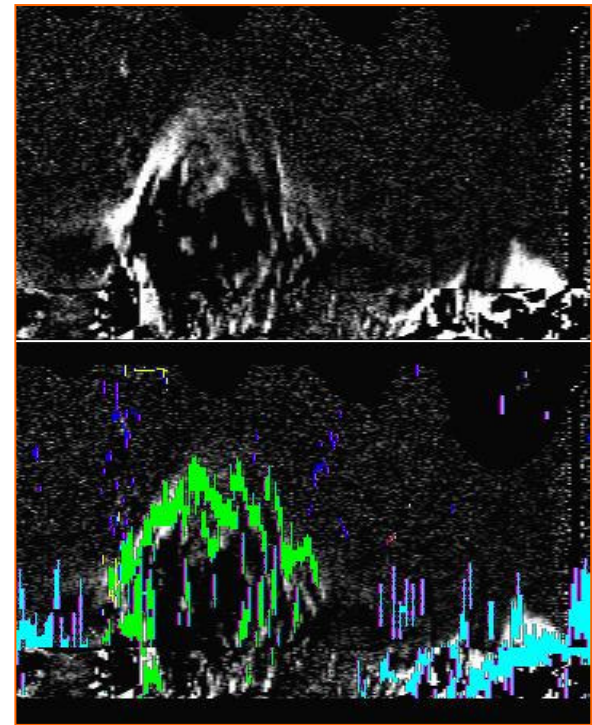
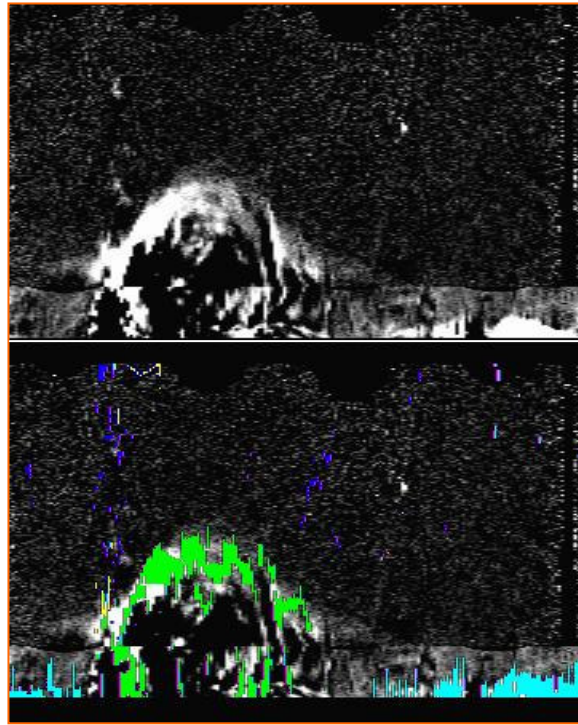
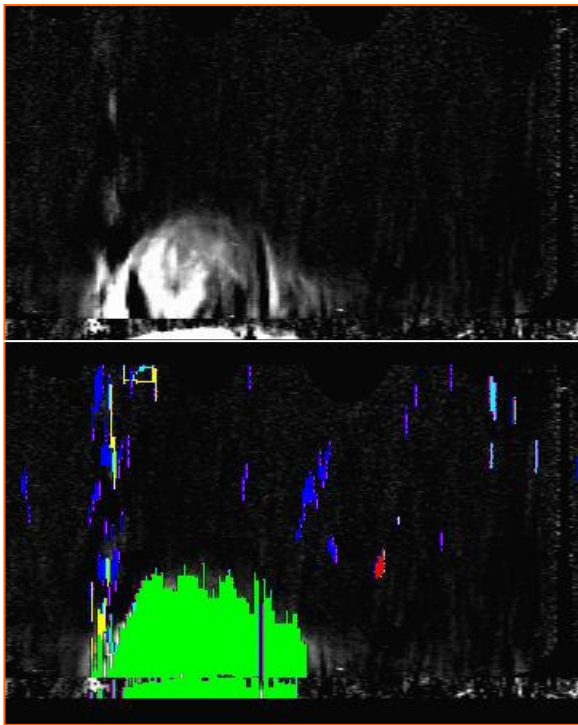
15h54



17h06

CACTus output

11 November 2003



15h18

15h54

17h06

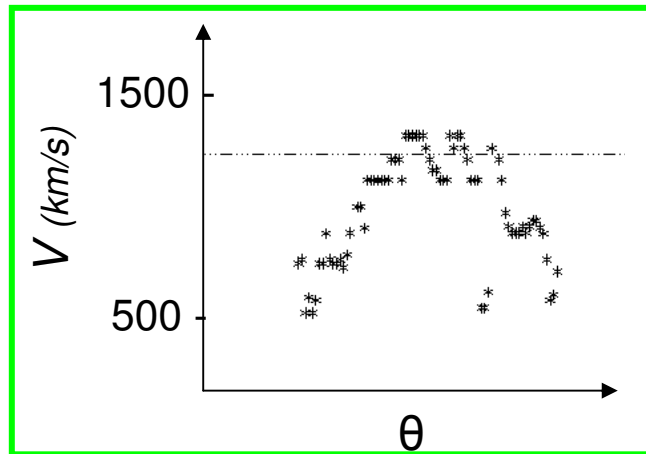
CACTus output

➤ Visualisation:

[angle,time]-map

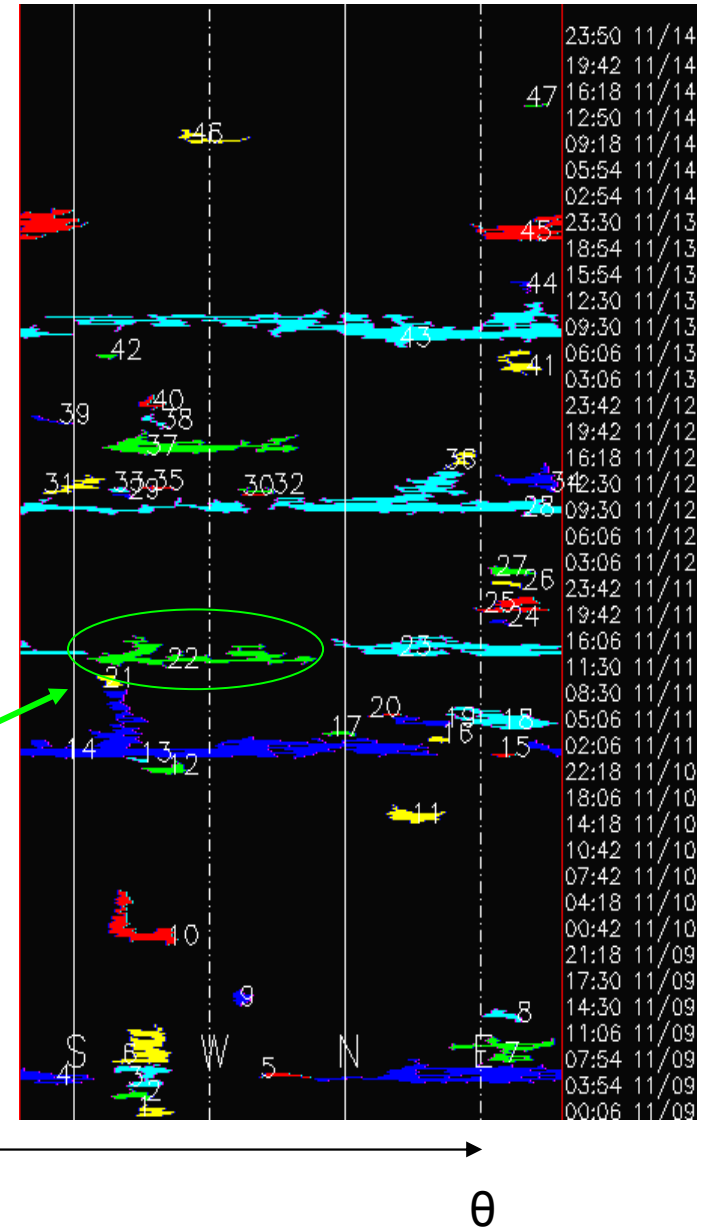
➤ parameters:

- time - width - angle →
- CME speeds



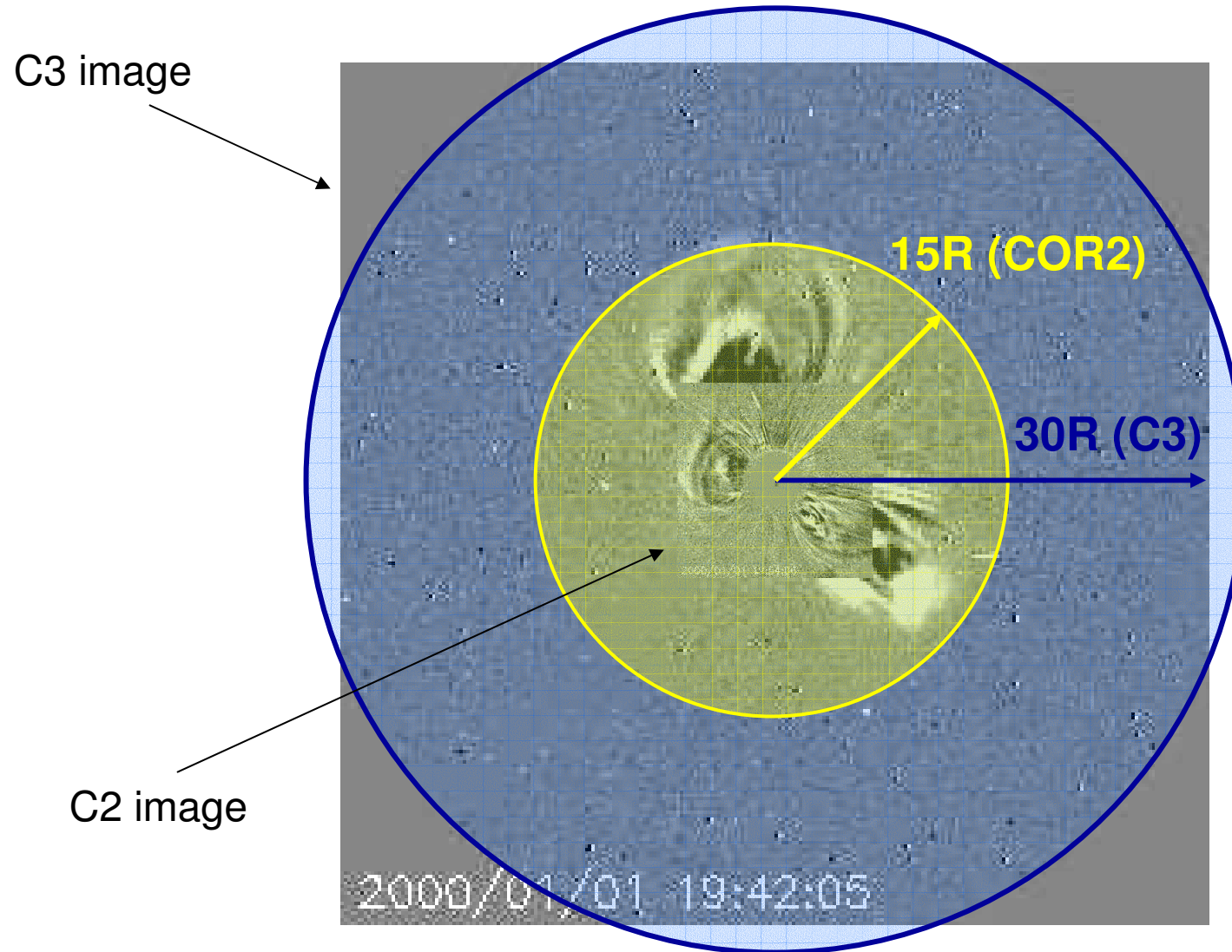
CME 22

Each colour indicates a different CME



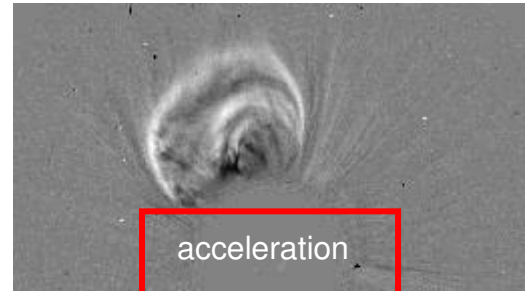
2. Performance on STEREO data

Influence of smaller f.o.v.

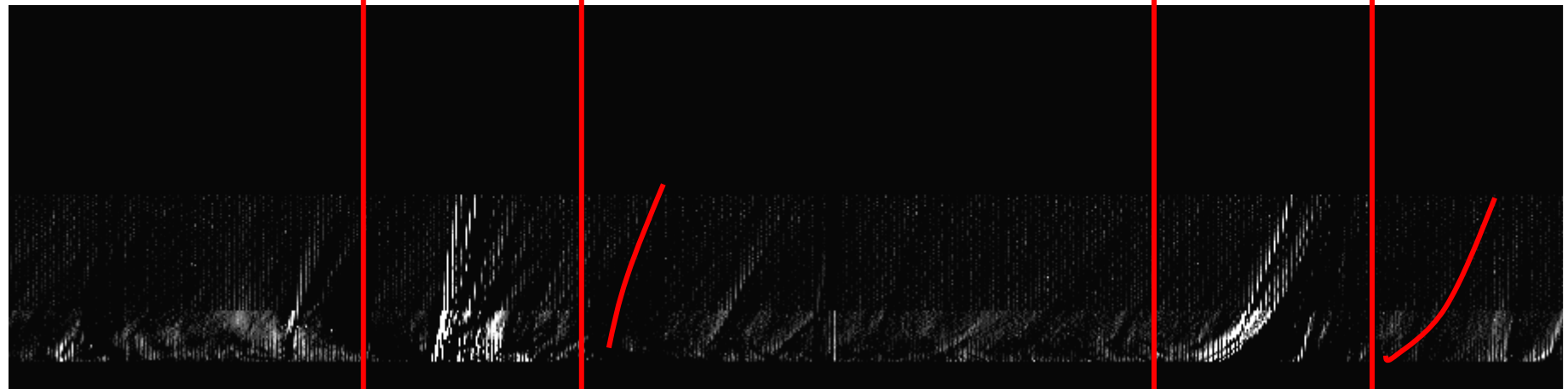
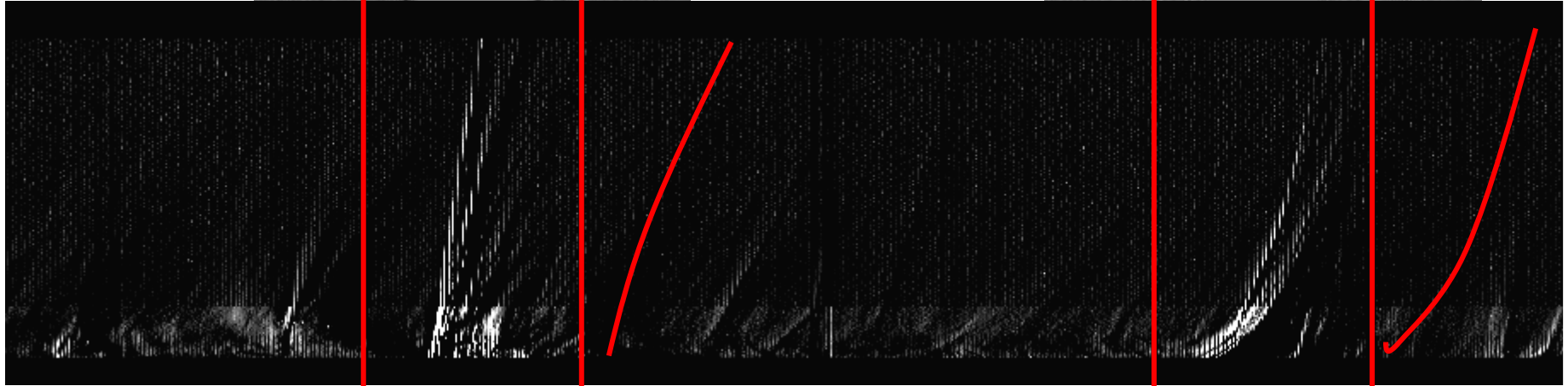




decelération



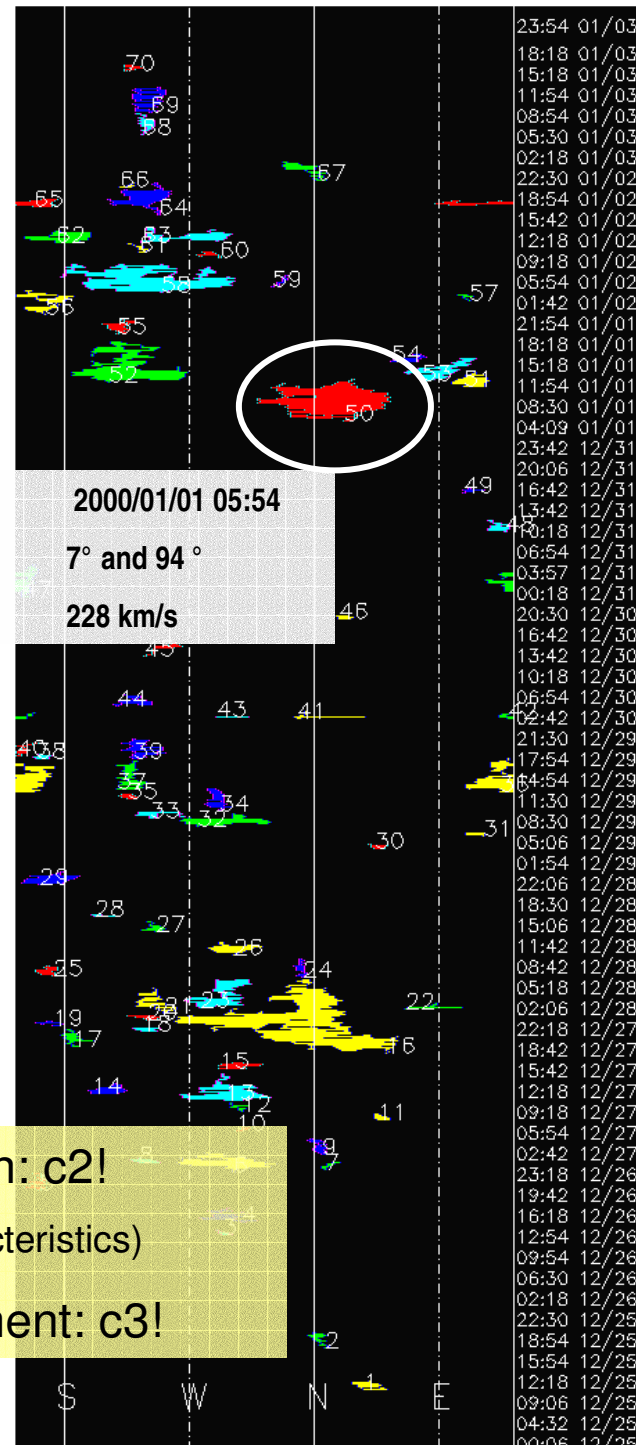
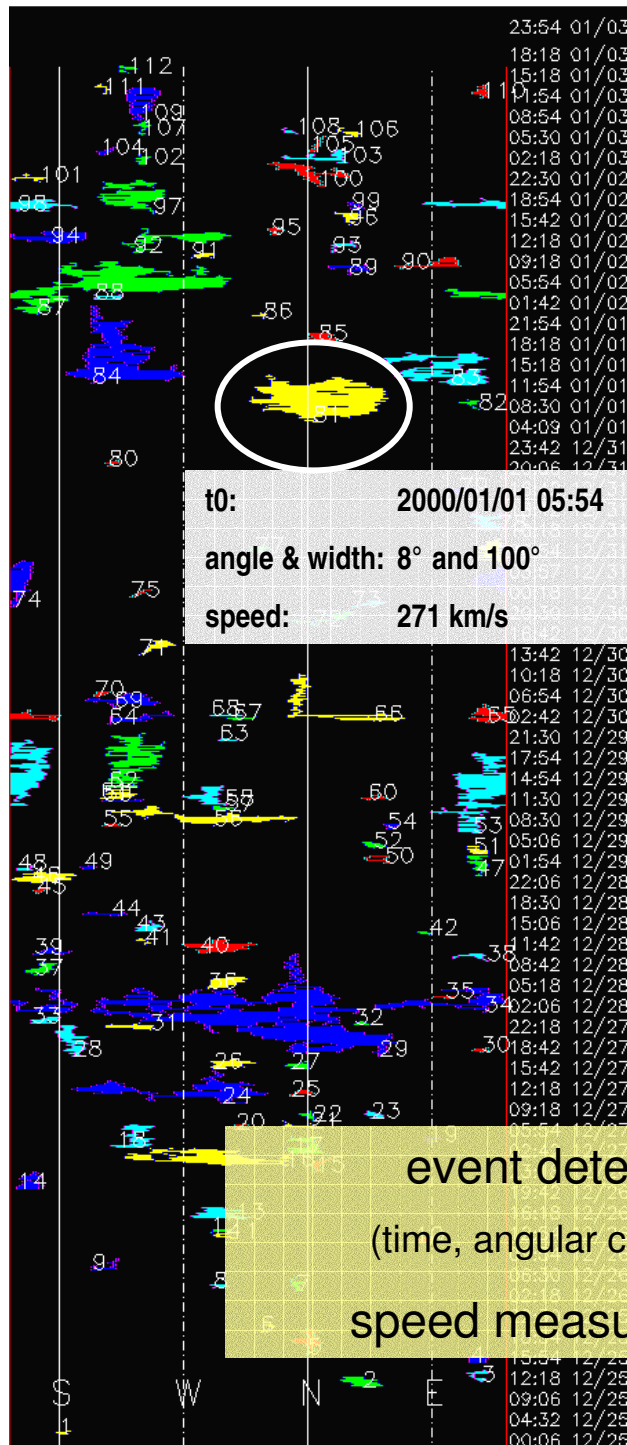
acceleration



r
 t

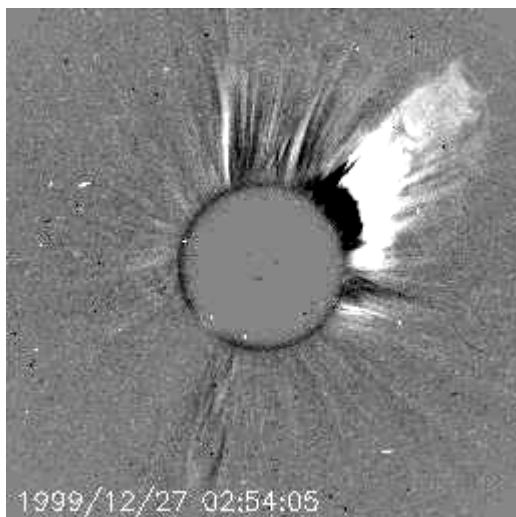
higher speed
measured

lower speed
measured

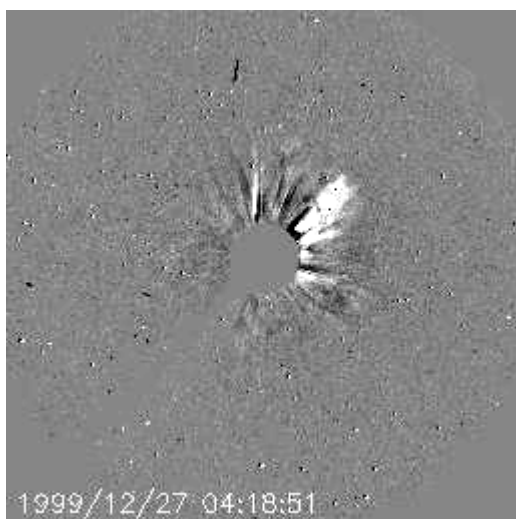


Resolution

C2



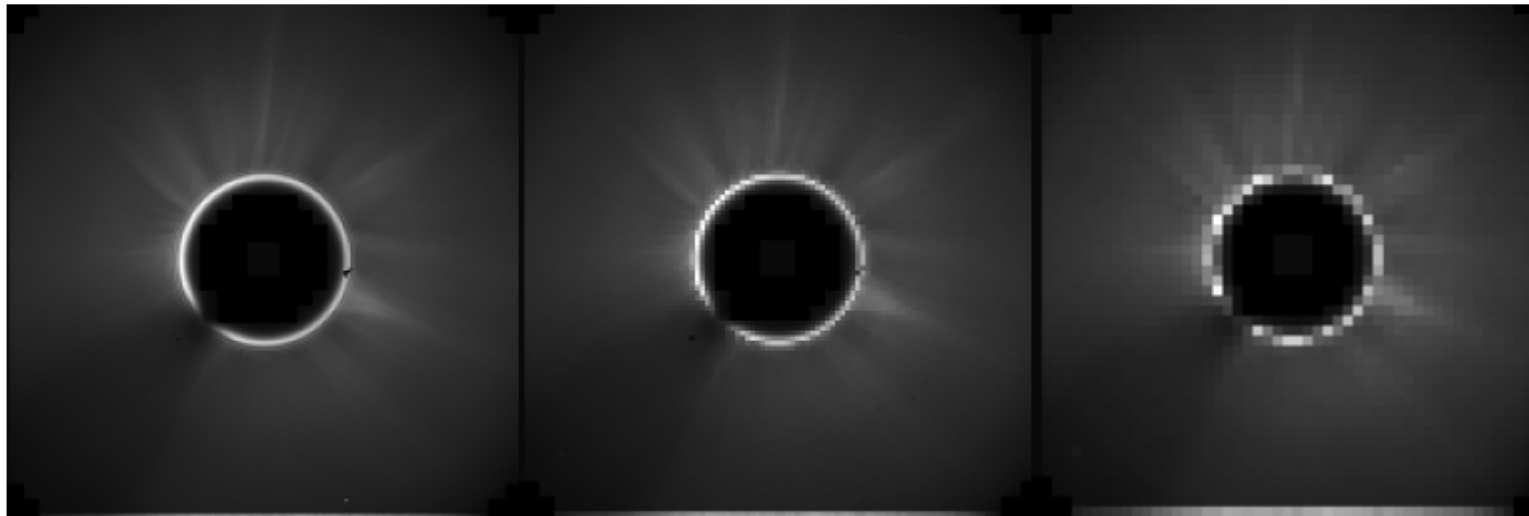
C3



- C3: 1024x1024 1px=56.0"
- C2: 1024x1024 1px=11.9"
 - 5 x higher resolution than C3
 - C2 f.o.v. = 1/5 C3 f.o.v.
- COR2: 2048x2048 1px=14.0"
 - 4 x higher resolution than C3
 - COR2 f.o.v. = 1/2 C3 f.o.v.

N bins	"
1024	28"
512	56"
256	112"
128	224"

← C3 (points to 56")
 ← Beacon cor2 (points to 112" and 224")
 Cactus: 138" (points to 112")

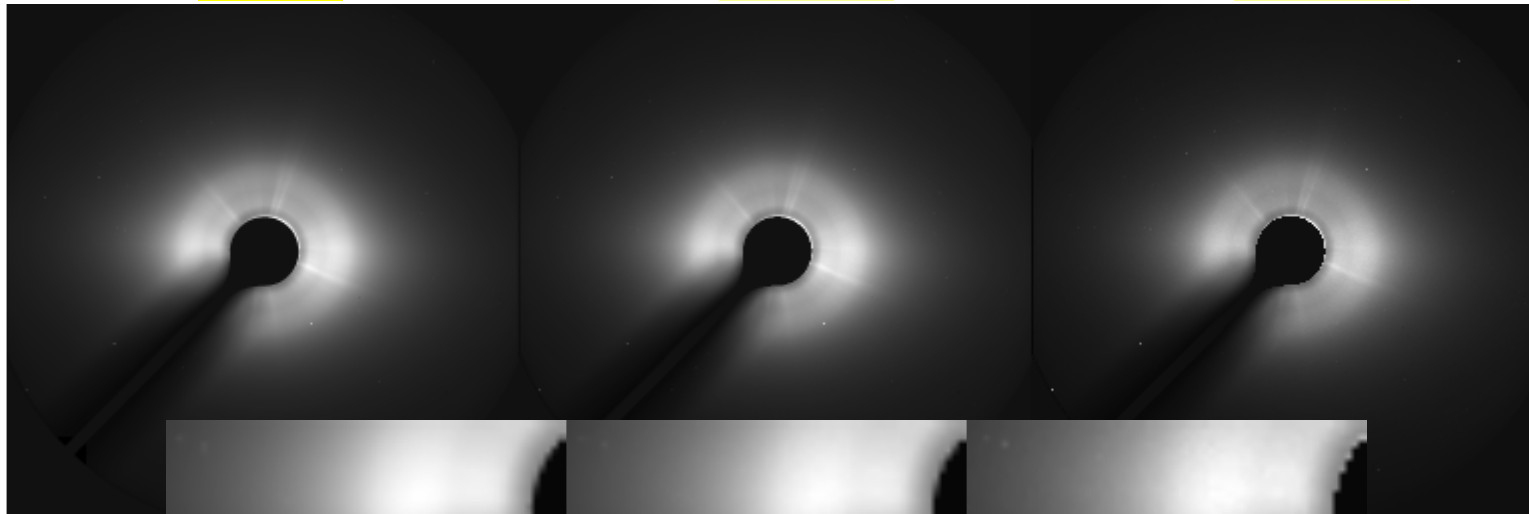
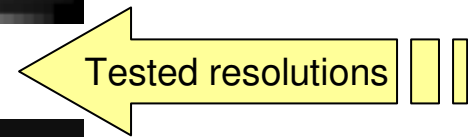


C2

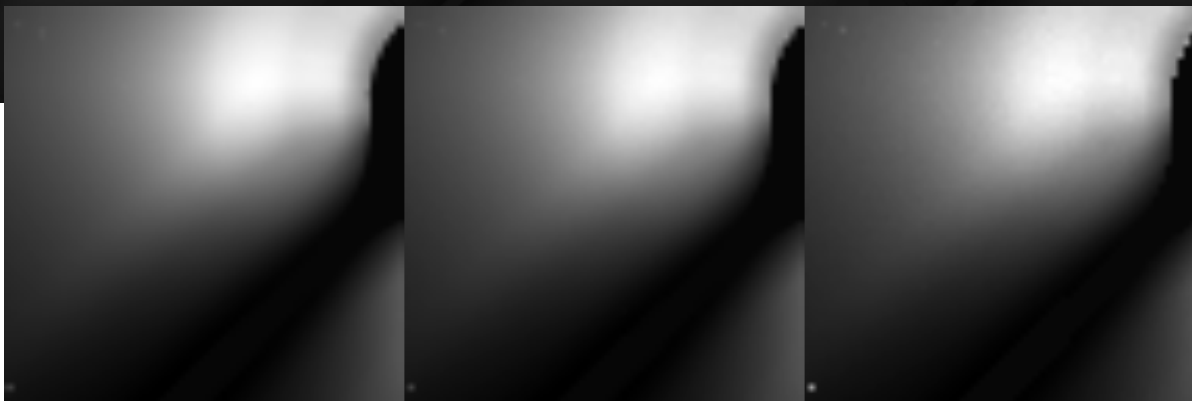
56"

112"

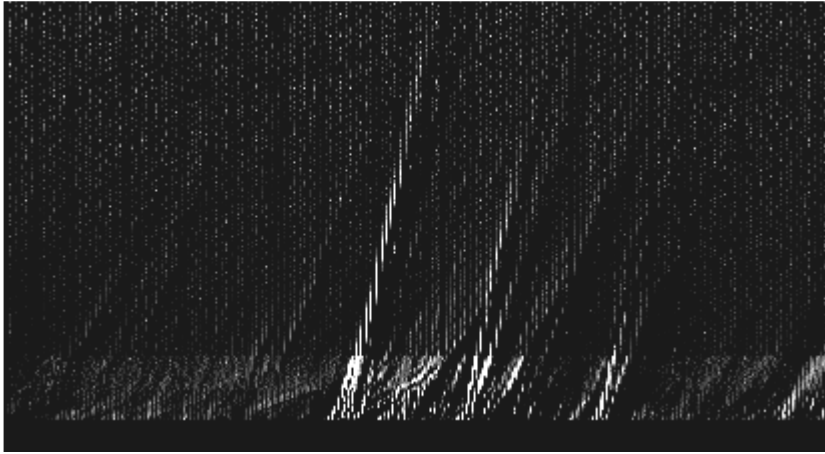
224"



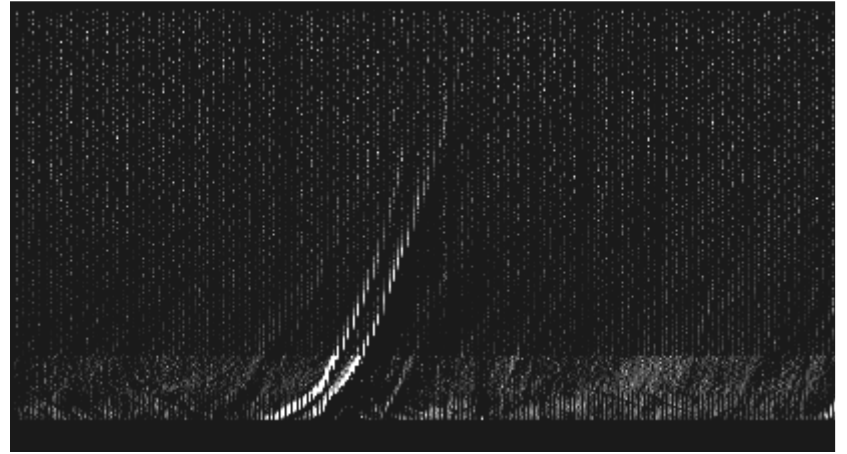
C3



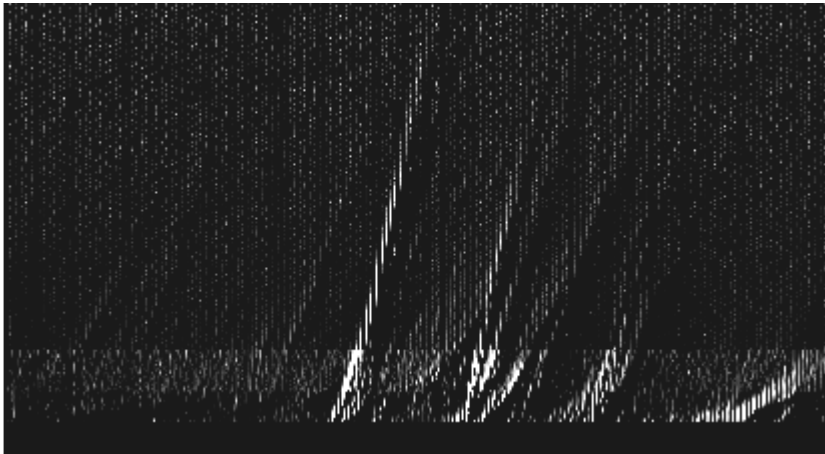
(c3 detail)



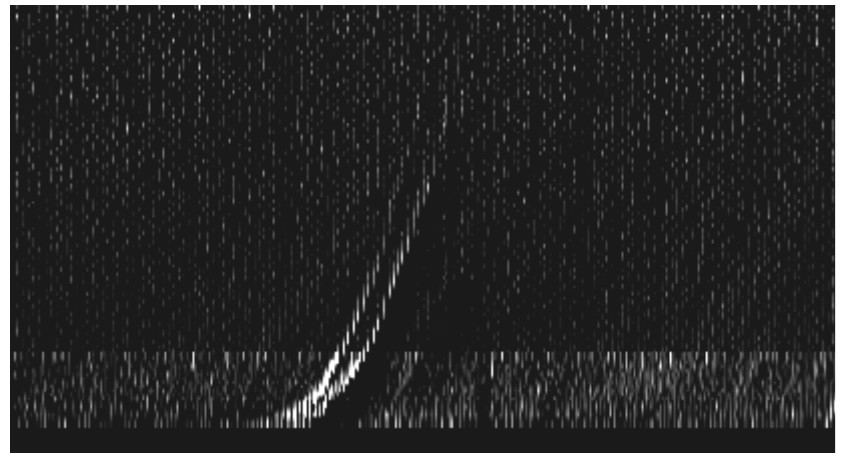
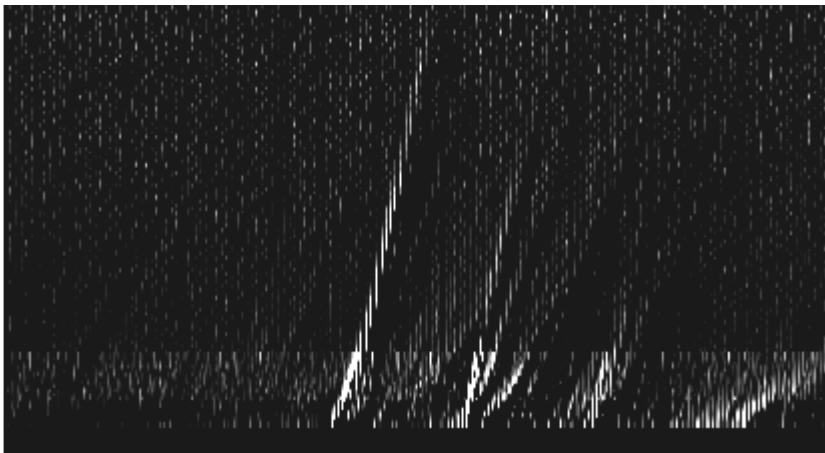
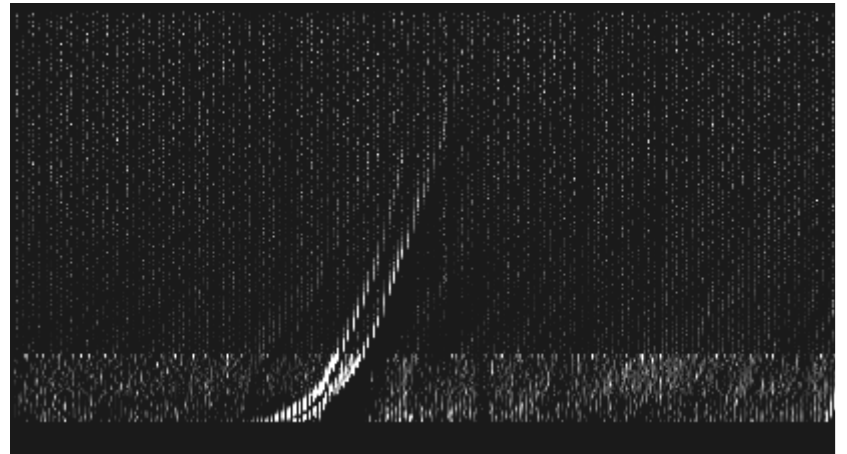
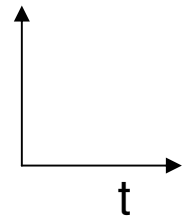
C2: 12"
C3:56"

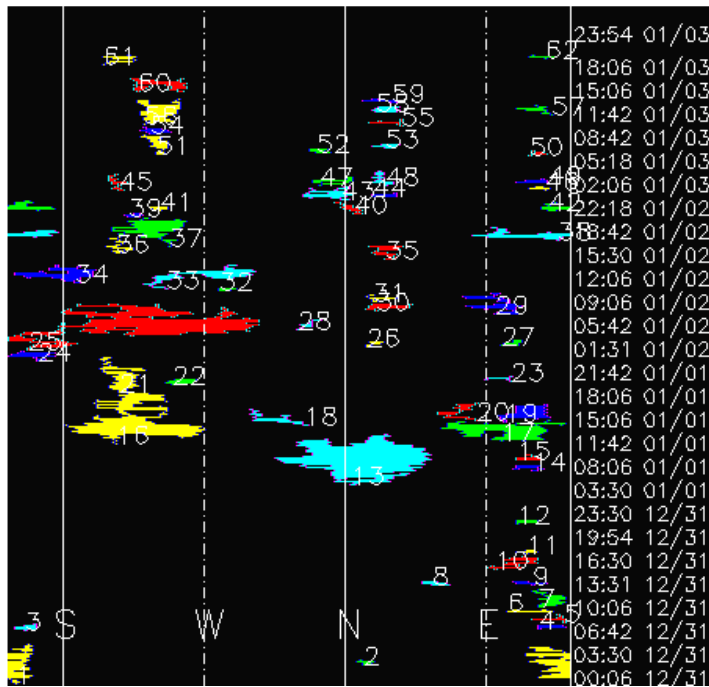


112"



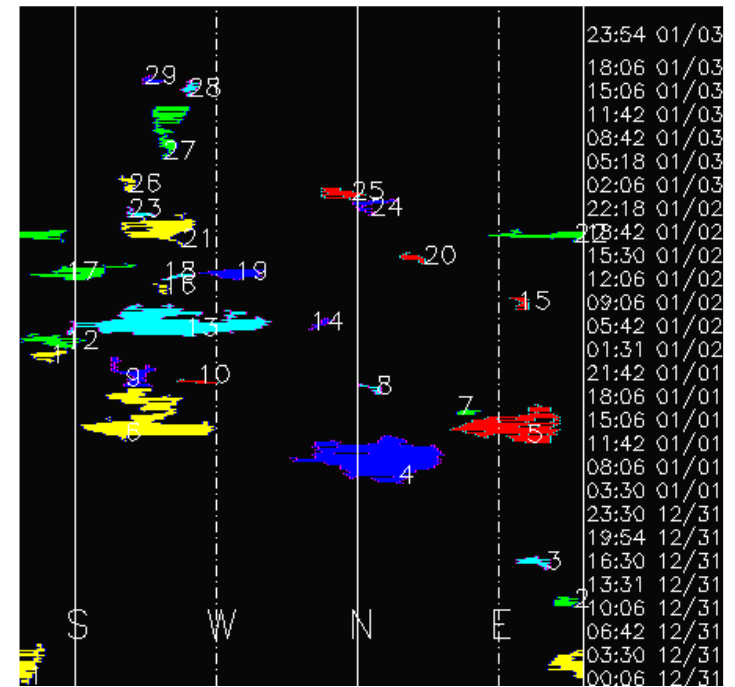
224"



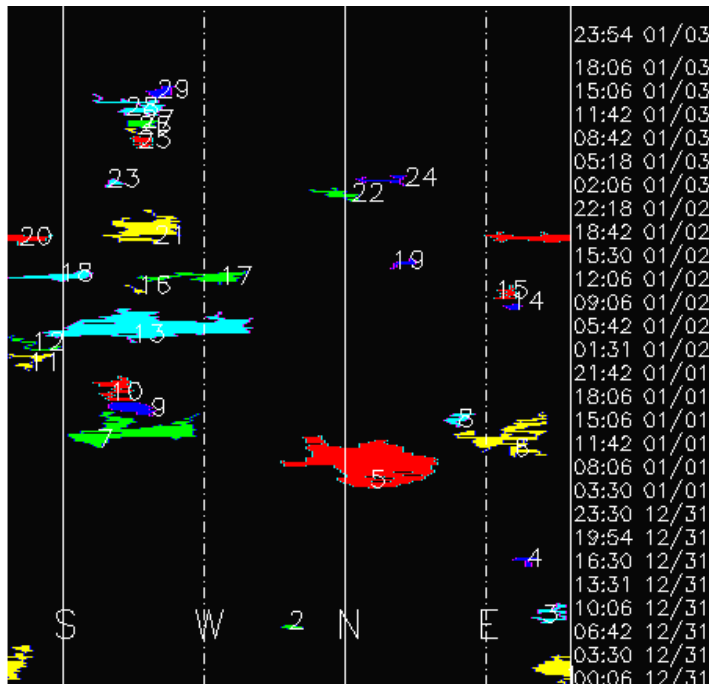


STEREO f.o.v.

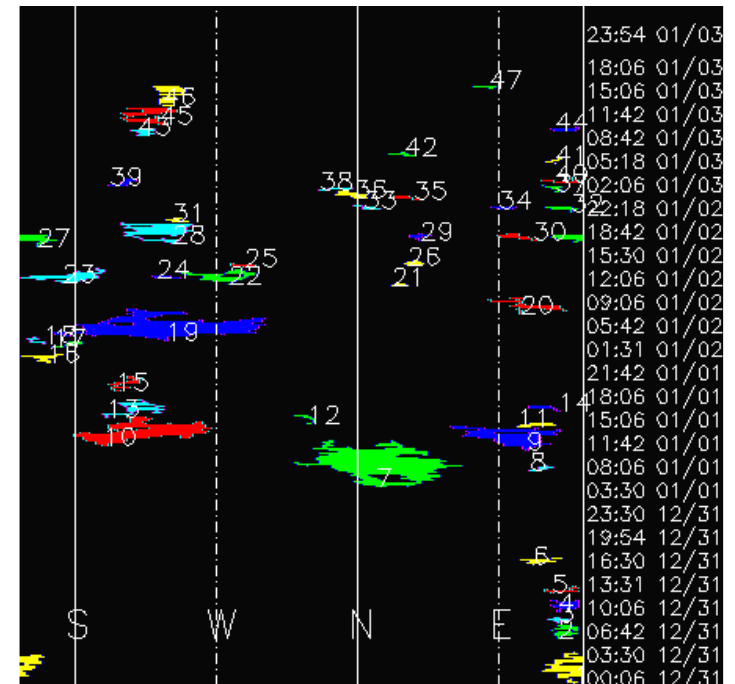
c2: 11.9"
c3: 56"



c2: 56"
c3: 56"



c2: 112"
c3: 112"



c2: 224"
c3: 224"

