CACTus performance on STEREO beacon-data

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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

\[ [\theta, r] \text{ for each } t \]

\[ \downarrow \]

\[ [t, r] \text{ for each } \theta \]
CME extraction

- CME signal ≈ straight line
- Method: Hough transform

Based on integration of intensity along the straight line

After 2 iterations

After n iterations …
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

Each colour indicates a different CME
2. Performance on STEREO data
Influence of smaller f.o.v.
higher speed measured

lower speed measured

deceleration

acceleration
t0: 2000/01/01 05:54
angle & width: 8° and 100°
speed: 271 km/s

2000/01/01 05:54
angle & width: 7° and 94°
speed: 228 km/s

event detection: c2!
(time, angular characteristics)
speed measurement: c3!

(time, angular characteristics)
Resolution

- **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.

<table>
<thead>
<tr>
<th>N bins</th>
<th>”</th>
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</thead>
<tbody>
<tr>
<td>1024</td>
<td>28”</td>
</tr>
<tr>
<td>512</td>
<td>56”</td>
</tr>
<tr>
<td>256</td>
<td>112”</td>
</tr>
<tr>
<td>128</td>
<td>224”</td>
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</tbody>
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Cactus: 138”  Beacon cor2  ?