

Automated Detection of CMEs Identification in Accelerating Solar Eruptions Inner Solar Corona using Parabolic Hough (CHSCO) Transform

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Radial Filtering and Disk Masking

Cartesian to Polar images

Fourier Motion Filtering to separate CME features

Reduce the Polar Image to 1-D

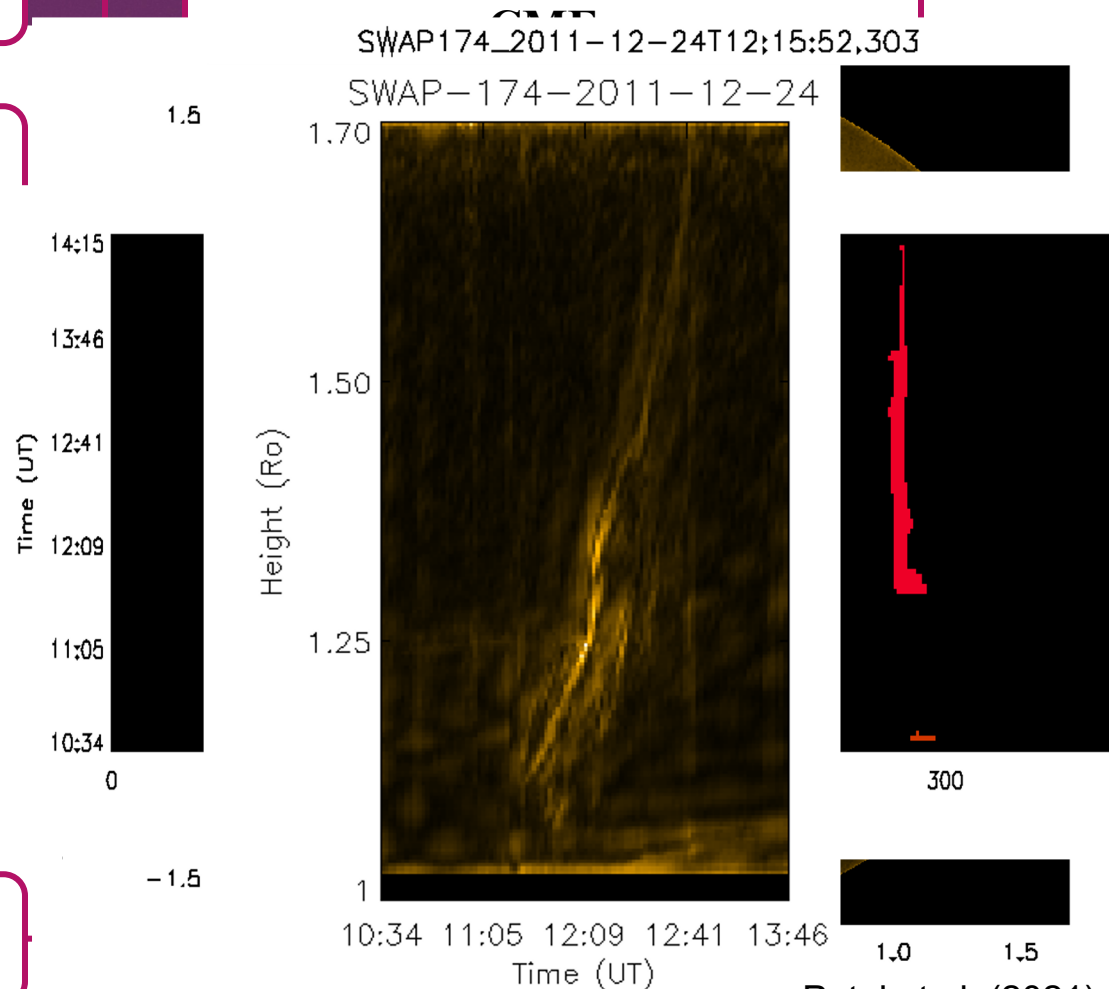
Create CME Map

Intensity Threshold and Label Regions

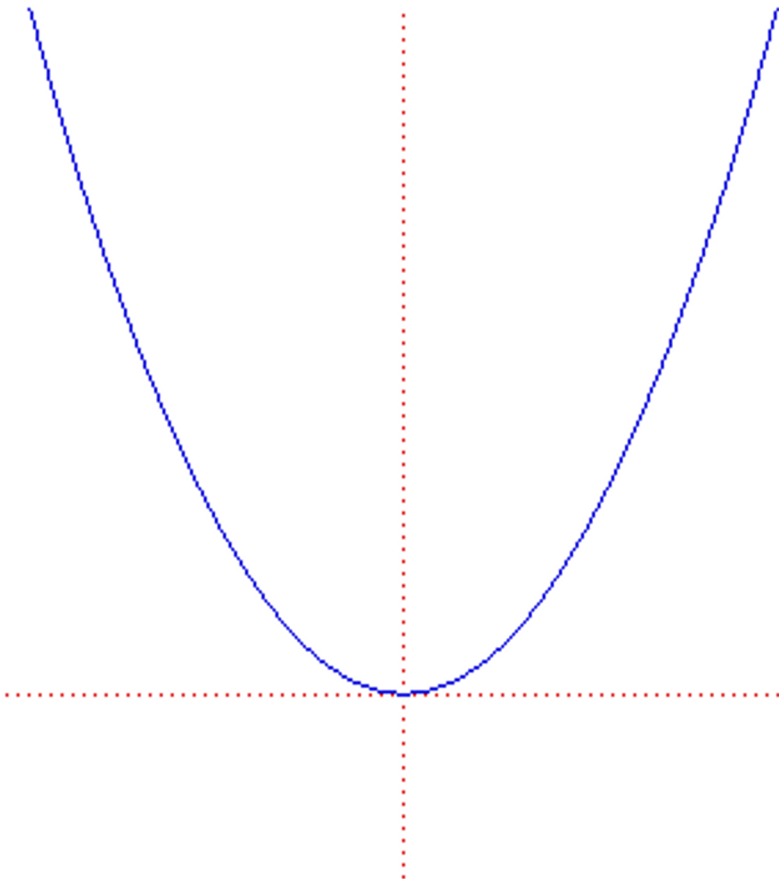
Generate Height-Time plot for CME identified images

Parabolic Hough Transform to Identify Accelerating CMEs

Record Kinematic Properties of



Parabola



10:34 11:05 12:09 12:41 13:46
Time (UT)

Height-time plot

Parabolic Hough Transform

- ❑ Detect parabola of the form:
$$(r-r_0) = S \times (t-t_0)^2$$
- ❑ Parameters: r_0 , t_0 , S and θ .
- ❑ r_0 is set at $1R_{\odot}$ and $\theta = 90^\circ$.
- ❑ $t_0 = t - \sqrt{[(1/S) \times (r-r_0)]}$
- ❑ Thus, a 4-D problem can be reduced to 2-D problem.



Thank you

RiP

Total Solar Eclipse 2019
July 2, San Juan, Argentina