Automatic event detection in search for inter-moss loops in IRIS Si IV slit-jaw images

Brian Fayock

co-authors:
Amy R Winebarger, Bart De Pontieu

(1) Center for Space Plasma and Aeronomic Research
University of Alabama in Huntsville, USA
(2) NASA Marshall Space Flight Center
Huntsville, AL 35812
(3) Lockheed Martin Solar & Astrophysics Laboratory
Palo Alto, CA 94304

May 21, 2015
Outline of Presentation

- Field of view for data set – IRIS Si IV – 1400 Å
- Event detection process
- Application to IRIS 1400 data
- Event grouping
- Statistical characteristics
Field of View – IRIS Si IV – 1400 A

First Observation
2013-10-23 T 07:09:30.590

Last Observation
2013-10-23 T 08:03:09.510

FOV = 60 x 64 arcsec
Algorithm detects the beginning and end of pixel brightening
Event Grouping

- Focus on one pixel
- Search adjacent pixels
- Must be within 20% of lifetime and 20% of progress data
- Continue through all detected pixels
Results

Si IV - 1400  Progress Meta Data  Grouping

- GREEN = beginning of an event
- BLUE = time of peak emission
- RED = end of an event
Grouping Results

Largest 5

Largest 50
Best Loop of Interest

Grouped & Condensed to 1 image

Trouble is that groups are generally not as well-defined as this
Statistical Results

Examples of Loops & Samples of Moss Activity

Identification of loops will most likely come from statistical results
Concluding Remarks

Event Detection

- Algorithm is still being fine-tuned as more data sets are explored
- Capable of obtaining all types of activity
- Statistics can limit determination of structure types
- Automatic characterization is still in development

Groups/structures can currently be selected by pixel location for individual character analysis: size, pixel density, lifetime

Current results suggest that the statistics can be used to determine the probability of whether a structure is classified as moss activity or something else