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Poster

2. Chromospheric heating and dynamics

Automated detection of transient moss features with AIA

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Rapidly varying active region moss was observed by Testa et al. 2013 in a short time series (∼150s) dataset from Hi-C (High-resolution Coronal Imager). The intensity fluctuations in sub-arcsecond 193A images (∼1.5 MK plasma), on the order of 15 seconds, were uncharacteristic of steadily heated moss and were considered as an indication of heating events connected to the corona. Intriguingly, these brightenings displayed a connection to the ends of high temperature loops seen in the corona.
Following the same active region AR11520, for 6 days across the solar disk we demonstrate an algorithm designed to detect the same temporal variability in lower resolution AIA data, thereby significantly expanding the number of events detected. Analogous regions are successfully detected at the footpoints of loops and in several areas appear to "sparkle" prior to a clear brightening in connected high-temperature loops; as confirmed in the hot AIA channels and the Fe XXVII line isolated by filter ratio. The result is illuminating as the same behavior has recently been shown by nano-flare simulations by Polito et al. 2018 using a thick-target beam approach. Here we investigate the correspondence of coronal heating events to loop footpoint response for the full time period, providing insight into the conditions required for such events to occur.
Results for several other regions are also presented with data obtained using the recently implemented search features at http://iris.lmsal.com/search/ for co-observed IRIS and AIA datasets.