Space Science Seminar
Tuesday, 2020 March 3
10:30 a.m.
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Analyzing ESIS Observations Using Convolutional Neural Networks

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Host: Dr. Amy Winebarger

Imaging spectrographs have many uses in solar astronomy. For optically thin lines, the line profiles can be interpreted very directly as a distribution of line of sight velocities. This gives us unique access to the macroscopic and microscopic dynamics of transition region and coronal plasmas. Traditional imaging spectrographs can only observe the sun through a very narrow slit, and must raster across the sun to acquire an image, resulting in an image with low temporal and/or spatial resolution. Montana State University and Marshall Space Flight Center have collaborated to develop a rasterless imaging spectrograph known as the EUV Snapshot Imaging Spectrograph (ESIS) which observes a wide field of view simultaneously, at the expense of a more challenging data analysis problem. We present a promising data analysis procedure where we use a model of the ESIS instrument and a convolutional neural network to learn the relationship between the data gathered by ESIS and the portion of the solar atmosphere being observed.

https://solarscience.msfc.nasa.gov/colloquia/