

Boulder - Space Weather Applications of Machine Intelligence (B-SWAMI) Seminar Series

Hosted by

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Zoom Session information at www.colorado.edu/spaceweather/events

Solar Flare Data Limitations and Prospective Solutions

Wendy Carande and Katy Luttrell

With an increasing number of machine learning models cropping up to address solar flare prediction, there is a looming question of whether we have sufficient data volume and quality to train these models. In this talk, we will discuss the limitations of existing solar flare data sets and how we may be able to address them. In addition to discussing these topics more broadly, we will discuss a student data augmentation project, described below.

Currently, the available data are high resolution SDO/HMI magnetograms which cover a portion of the 24th solar cycle and the historical, lower-resolution SOHO/MDI magnetograms which recorded 15 years of data including the 23rd solar cycle in its entirety. The key to improving the predictive performance of solar flare prediction models may be augmenting the current data with synthetic magnetograms which have the quality of the SDO/HMI images for the time period of the SOHO/MDI images. This new type of data can be made using a Generative Adversarial Network to perform image translations from SOHO/MDI magnetograms to synthetic images.