

Project Details

ROSES ID: NNH21ZDA001N-LWSTM

Selection Year: 2021

Program Element: Data, Tools, & Methods

Project Title:

Readying 25 years of full-disk EUV images for machine learning

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Summary:

We will create the full set of ML-ready EUV data from 1995 to present, accessible via the cloud, by bringing in historical restoration of the STEREO/SOHO era in with present datasets into an machine-learning (ML)-ready dataset. The data synthesis will enable 360 degree views of sun and the combined cadences will allow better use of less-sampled EUV instruments with higher-cadence sets. Use of cloud computing will simplify researcher access compared with current high-level datasets. Solving this requires creating homogenous data from source instruments of different resolution, cadence, and slight wavelength differences as well as dealing with cross-calibration. While spatial sampling is a solved problem, differences in cadence in particular will require experimentation to yield cross-comparable results. This work enables research on events, evolution of solar irradiance, segmentation approaches, 360 degree maps of the sun, and other research topics as well as for use with space weather. In terms of data access, at APL we have access to the STEREO/EUVI and SOHO/EIT data, while SDO has created ML-ready data (Galvez et al, 2019). Our team already works with ML and cloud heliophysics data as well as the open standard Heliophysics API (HAPI 2.0) and SunPy.

Publication References:

no references