WHAT IS THE SOLAR WIND?
- The Sun has an extended atmosphere that radiates outward into space made of charged particles, or plasma, that we call the Solar Wind.
- Earth is constantly bathed in solar wind which can impact communication systems, GPS, long term space exploration and astronaut safety.
- Understanding solar wind is essential to understanding the space weather in which we live.

HOW IS IT MEASURED?
- The WIND spacecraft collects magnetic field data of the solar wind.
- Magnetic discontinuities appear as abrupt changes in the timeseries when a boundary is passed.

Labeled Data
- We worked with hand-labeled data (1 day) and heuristically labeled data (15 years) from experts annotating the start and end of a discontinuity.

Date | Start Time (h:mm:ss) | End Time (h:mm:ss) | Mean Time (h:mm:ss)
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11-18-2018 | 07:37:38 | 07:38:02 | 07:37:50

One hand-labeled discontinuity visualized

OUTCOMES
- The goal of the project was to develop a pre-processing pipeline to prepare the magnetic field data and labeled discontinuities for a supervised machine learning pipeline.

NEXT STEPS
- Implement techniques to overcome small training dataset size (contrastive learning, hard example mining)
- Create a catalogue of 15 years worth of labeled data.

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