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Oral
(Contributed Talk)
Observing and forecasting Coronal Mass Ejections (CME) is crucial due to the potentially strong geomagnetic storms generated and their impact on satellites and infrastructures. With its near-real-time availability, STEREO-HI beacon data is the perfect data product for efficient
forecasting of CMEs.
However, previous work from Bauer et al. (2021) concluded that predictions based on beacon data could not achieve the same accuracy as with high-resolution science data due to data gaps and lower quality.
We present our novel pipeline, “beacon2science,” which bridges the gap between beacon and science data to improve CME arrival time forecasting. First, we enhance the quality and spatial resolution of beacon data while keeping our method output consistent between consecutive frames.
We then focus on improving the temporal resolution of beacon data by training a data-driven model to infer the CME movement between images and create novel interpolated frames. The improved beacon images show clearer CME features with improved noise-to-signal ratio and increase the CME front visibility at higher elongation values within the STEREO HI-1 field of view.
We compare the quality and fidelity of the upgraded beacon mode data to the actual science data and study the improvement in the forecasting capabilities of our Ellipse Evolution model based on Heliospheric Imager observations (ELEvoHI).
Finally, with STEREO-A close to L4 and the solar cycle maximum, we highlight the synergies between our improved near-real-time data, PUNCH polarized data, and other spacecraft points of view.
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