



## **Modeling of coronal mass ejections with the STEREO heliospheric imagers verified with in situ observations by the Heliophysics System Observatory**

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We present the first study to verify modeling of CMEs as observed by the heliospheric imagers on the two STEREO spacecraft with a large scale dataset of in situ plasma and magnetic field observations from the Heliophysics System Observatory, including MESSENGER, VEX, Wind, and the in situ measurements on the two STEREO spacecraft.

To this end, we have established a new interplanetary CME catalog (ICMECAT) for these spacecraft by gathering and updating individual ICME lists. In addition, we have re-calculated the in situ parameters in a consistent way, resulting in 668 events observed between 2007-2015. We then calculated the efficacy of the STEREO/HI instruments for predicting (in hindsight) with the SSEF30 model the arrival time and speed of CMEs as well as hit/miss ratios. We also show how ICMECAT gives decent statistics concerning CME impacts on all of the terrestrial planets, including Mars.

The results show some major implications for future heliospheric imagers which may be used for space weather forecasting. Our effort should also serve as a baseline for the upcoming new era in heliospheric science with Solar Orbiter, Solar Probe Plus, BepiColombo returning partly comparable observations in the next decade.

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