Science objective B1

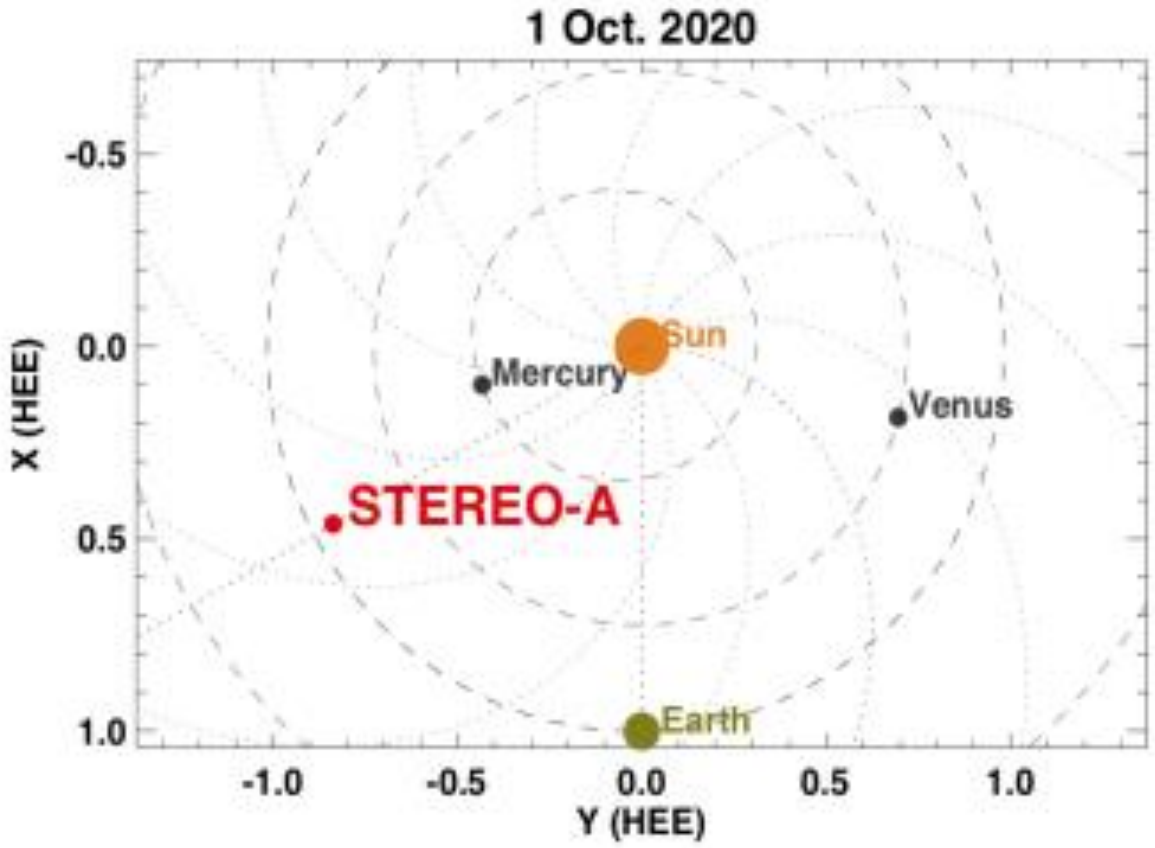
Presentation by Carlos Braga

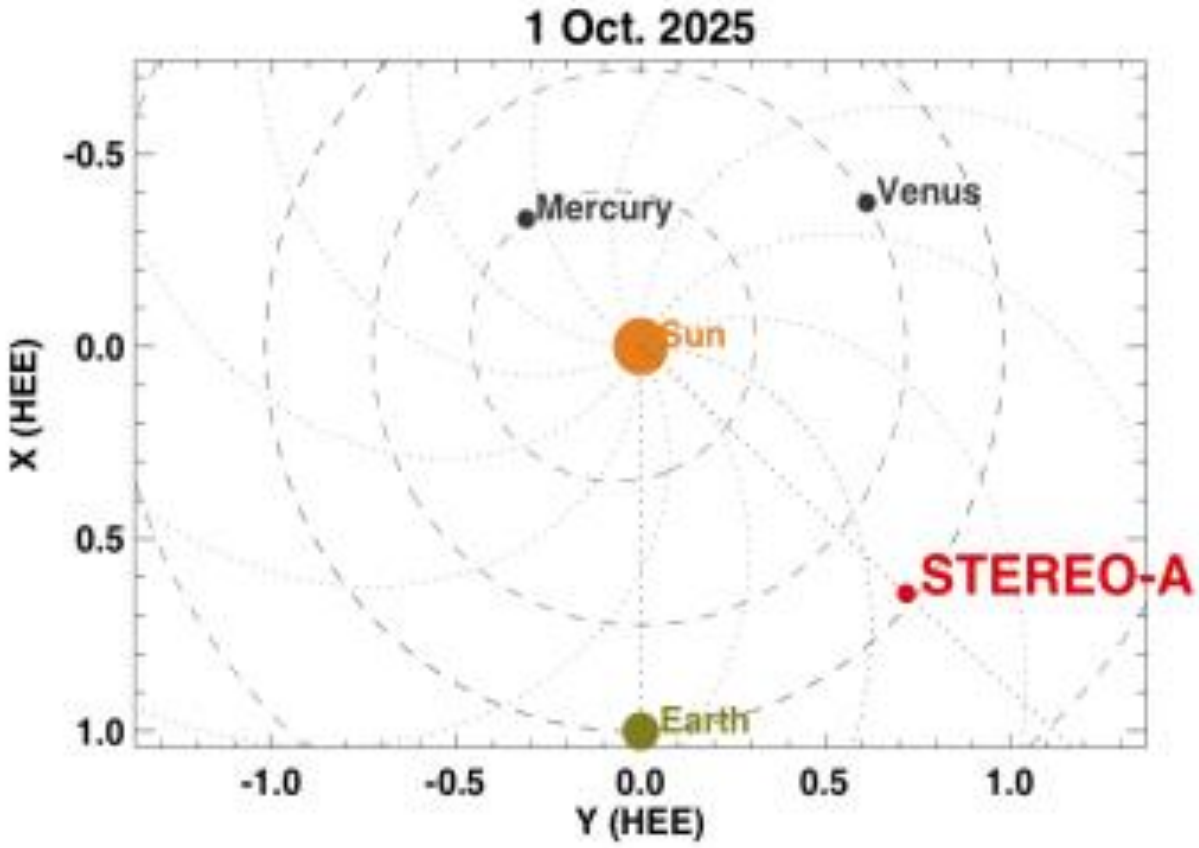
George Mason University

Sci. Obj. Set B:
Applying STEREO Observations Toward Evaluating Off-L1 Location Space Weather Research

Science Objective B1:

How Do Coronal and Heliospheric Observations Obtained within ±60º Longitude of L1 Affect Space Weather Forecast Model Results





Previous L4/L5 observations:

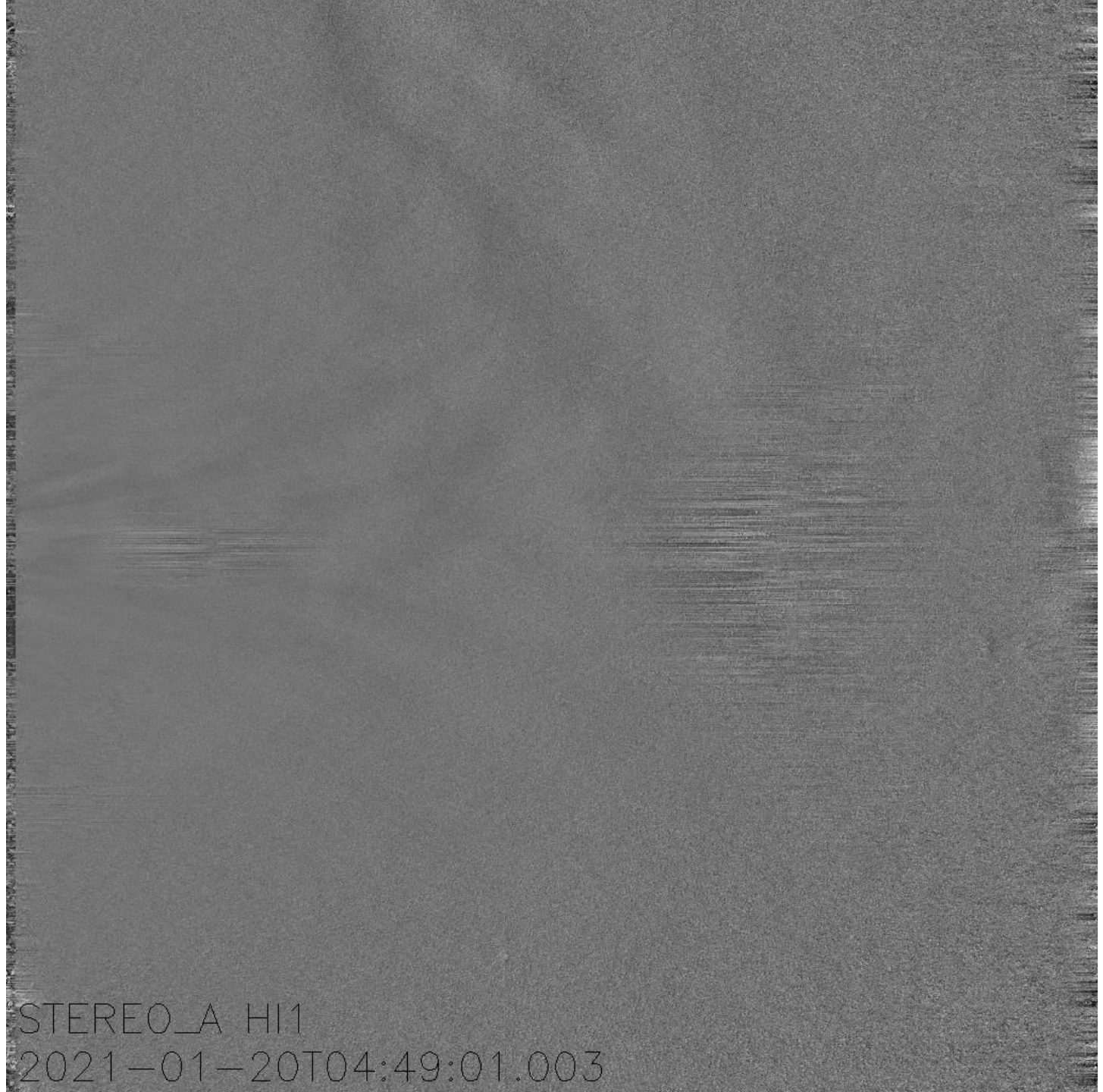
November 2009 (ST-B at L5 and ST-A and L4)

Plans

- Earth-directed CMEs-> observed by Heliospheric Imagers 1 or 2
- Up to 15 degrees from L5
  - April 15, 2020, and August 1, 2021
- 92 CMEs observed by HI-1 (Helcats)
- 21 ICMEs https://helioforecast.space/icmecat

Plans

- Time-of-Arrival (ToA) and Speed-on-Arrival (SoA)
- Forecasting B: 3DCORE model
- hit/miss perspective (less explored than ToA and SoA) (Vourlidas+ review)


STEREO_A HI1
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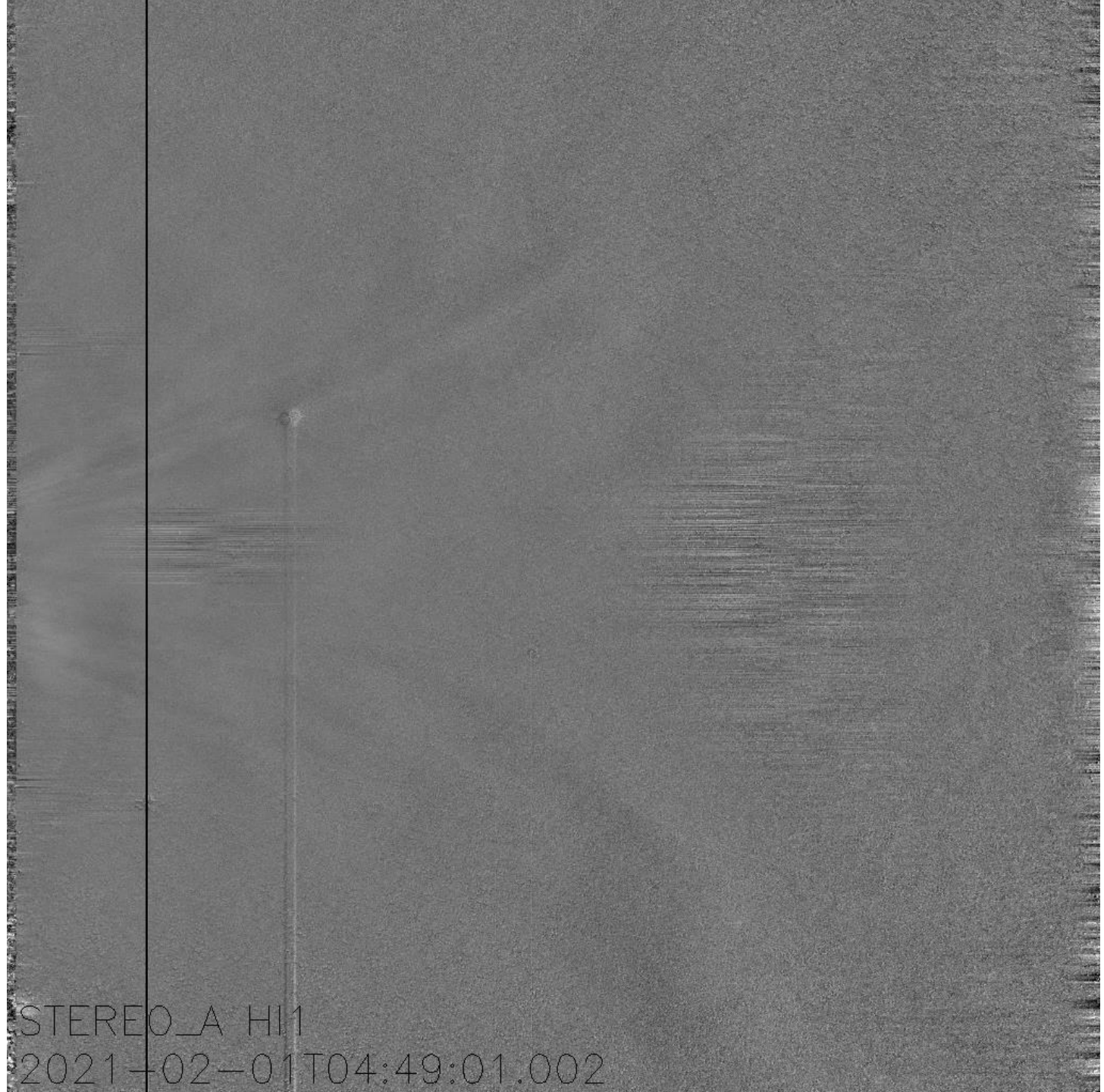
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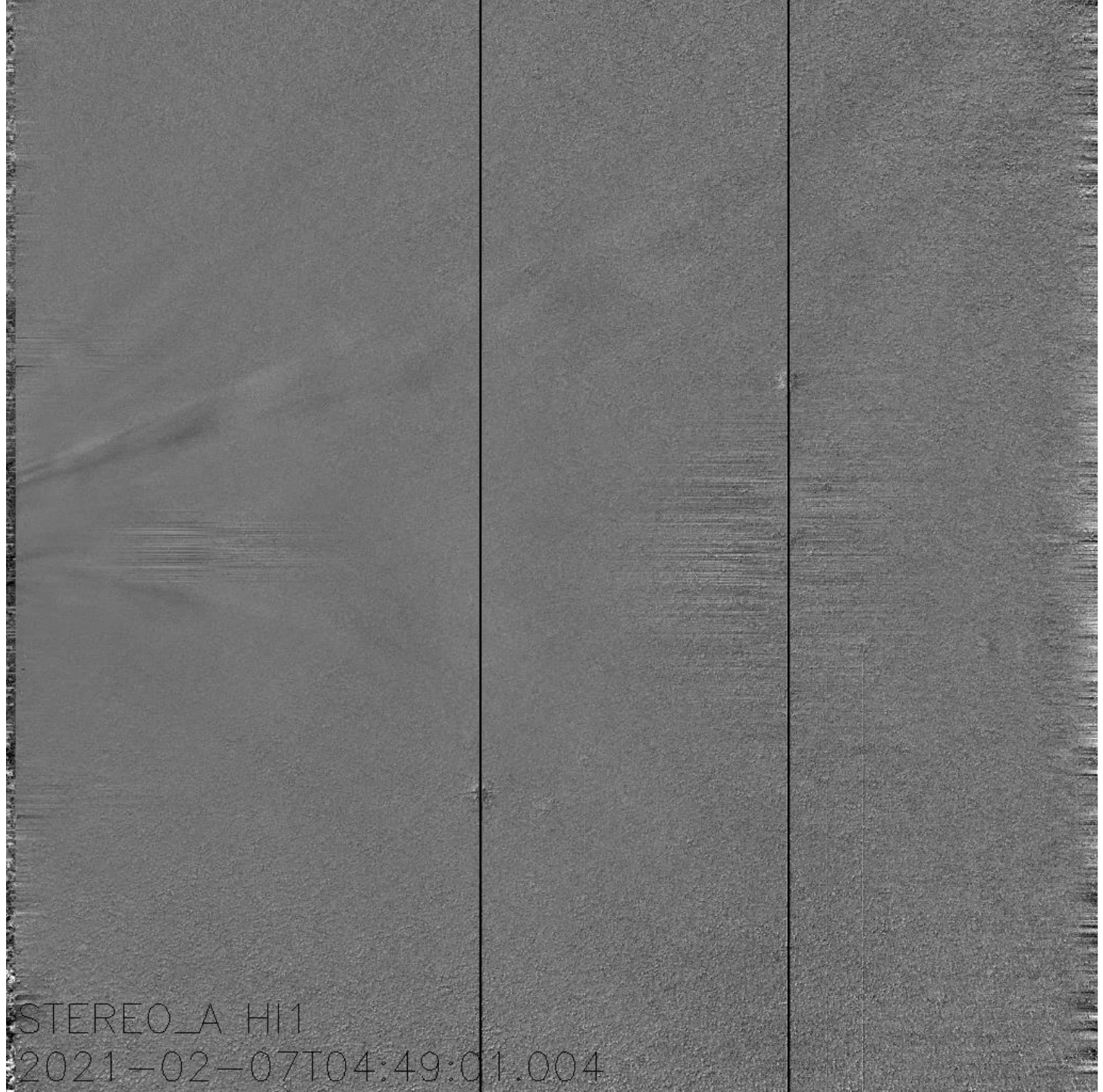
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Publications

- Paouris, E., Čalogović, J., Dumbović, M. et al. Propagating Conditions and the Time of ICME Arrival: A Comparison of the Effective Acceleration Model with ENLIL and DBEM Models. Sol Phys 296, 12 (2021). https://doi.org/10.1007/s11207-020-01747-4
- Lang, M., Witherington, J., Turner, H., Owens, M. J., & Riley, P. (2021). Improving solar wind forecasting using data assimilation. Space Weather, 19, e2020SW002698. https://doi.org/10.1029/2020SW002698
- Braga, C. R., Vourlidas, A., Stenborg, G., Dal Lago, A., de Mendonça, R. R. S., & Echer, E. (2020). Predicting the time of arrival of coronal mass ejections at Earth from heliospheric imaging observations. Journal of Geophysical Research: Space Physics, 125, e2020JA027885. https://doi.org/10.1029/2020JA027885
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- Evangelos Paouris, Angelos Vourlidas, Athanasios Papaioannou, Anastasios Anastasiadis, (2021), Assessing the Projection Correction of Coronal Mass Ejection Speeds on Time-of-Arrival Prediction Performance Using the Effective Acceleration Model, Space Weather, 19, 2, https://doi.org/10.1029/2020sw002617
- Zhang, Jie; Temmer, Manuela ; Gopalswamy, Nat ; Malandraki, Olga ; Nitta, Nariaki V. ; Patsourakos, Spiros ; Shen, Fang ; Vršnak, Bojan ; Wang, Yuming ; Webb, David ; Desai, Mihir I. ; Dissauer, Karin ; Dresing, Nina ; Dumbović, Mateja ; Feng, Xueshang ; Heinemann, Stephan G. ; Laurenza, Monica ; Lugaz, Noé ; Zhuang, Bin Earth-affecting solar transients: a review of progresses in solar cycle 24 Progress in Earth and Planetary Science, Volume 8, Issue 1, article id.56, 2021, https://doi.org/10.1186/s40645-021-00426-7
- E. Asvestari, J. Pomoell, E. Kilpua, S. Good, T. Chatzistergos, M. Temmer, E. Palmerio, S. Poedts and J. Magdalenic Modelling a multi-spacecraft coronal mass ejection encounter with EUHFORIA. Astronomy & Astrophysics, 65, A27, 18 https://doi.org/10.1051/0004-6361/202140315

Articles (probably not sponsored by STEREO)

- - Amerstorfer, T., Hinterreiter, J., Reiss, M. A., Möstl, C., Davies, J. A., Bailey, R. L. et al. (2021). Evaluation of CME arrival prediction using ensemble modeling based on heliospheric imaging observations. Space Weather, 19, e2020SW002553. https://doi.org/10.1029/2020SW002553
- - Amerstorfer, T., Hinterreiter, J., Reiss, M. A., Möstl, C., Davies, J. A., Bailey, R. L. et al. (2021). Evaluation of CME arrival prediction using ensemble modeling based on heliospheric imaging observations. Space Weather, 19, e2020SW002553. https://doi.org/10.1029/2020SW002553
- - Rodriguez, L., Scolini, C., Mierla, M., Zhukov, A. N., & West, M. J. (2020). Space weather monitor at the L5 point: A case study of a CME observed with STEREO B. Space Weather, 18, e2020SW002533. https://doi.org/10.1029/2020SW002533