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(Talk Canceled) Kinematics of Coronal Mass Ejections: Leveraging Antarctic Observational Platforms for Enhanced Space Weather Monitoring.

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Coronal Mass Ejections (CMEs) are large-scale solar eruptions capable of triggering severe space weather events, particularly impacting high-latitude regions such as the polar zones. Accurate determination of CME kinematics—velocity, acceleration, and trajectory—is critical for early warning systems and for understanding the solar-terrestrial interaction. In this study, I analyze the kinematic profiles of selected CME events using coronagraph data from SOHO/LASCO, applying height-time analysis and polynomial fitting techniques to derive their propagation characteristics.

My ongoing research explores how incorporating ground-based observational data from polar regions—particularly from Antarctica—can improve the temporal resolution and continuity of CME tracking. The Antarctic environment offers distinct advantages for solar observations, including extended daylight periods, low atmospheric disturbance, and minimal radio frequency interference. I propose that integrating data from Antarctic observatories with space-based missions could refine heliospheric models and enhance real-time space weather forecasting, especially for systems vulnerable to solar activity in polar latitudes.

This study supports the broader objective of the SCAR AAA initiative to optimize astronomical research infrastructure in extreme environments. Preliminary findings highlight the value of Antarctic observational platforms in strengthening global CME monitoring networks and advancing our understanding of solar eruptive phenomena.

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