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The Synthetic Coronal Outflow Model (SynCOM) is an empirical data-driven model that simulates the outflow dynamics of the solar corona based on high-resolution observations. It replicates the transient and quasi-periodic behavior observed in previous STEREO-A/COR2 data. SynCOM generates synthetic images with realistic radial scaling of polarized brightness, incorporating stochastic components to account for physical fluctuations of plasma outflow and instrumental noise. SynCOM is based on user-defined flow velocity and acceleration profiles for each position angle and an adjustable signal-to-noise ratio, facilitating accurate testing of flow velocity measuring techniques. The model's settings can be tailored to specific coronal conditions and instrument parameters, enabling accurate comparisons of performance across different flow measuring methods. Moreover, the validation of these flow velocity algorithms is crucial for understanding the origin of the solar wind and supporting future missions like the Polarimeter to Unify the Corona and Heliosphere (PUNCH) mission. In this study, we present an update to the SynCOM application that meet the observational requirements for detecting coronal flows beyond the altitudes covered by previous observations. Additionally, we are exploring the possibility of applying our methods using FORWARD modeling. This work aims to establish benchmarks for widely used flow tracking methods and cross-validate their outputs, contributing to the advancement of flow measurement techniques in the field of solar physics.
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