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Ray-tracing simulations of coronal structures in the context of SolO/Metis observations

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Coronal structures observed in visible light by coronagraphs are projected onto the plane of the sky due to the optically thin nature of the solar corona. Ray-tracing simulations of Thomson-scattered visible light therefore represent a powerful tool for interpreting how three-dimensional coronal features appear in coronagraphic images. In addition, the observer's vantage point plays a crucial role in shaping the observed morphology of these structures. In this work, we present ray-tracing simulations of various coronal structures, including coronal mass ejections, loops, and coronal plumes, tailored to the observational conditions of the Metis coronagraph onboard Solar Orbiter. We highlight the advantages offered by Metis' high temporal cadence for tracking the dynamical evolution of coronal features. Furthermore, we show how out-of-ecliptic observations are essential for a comprehensive characterization of the solar corona, particularly at polar latitudes.

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