



Contribution ID: 386

Type: Poster

## Coronal Dimmings associated with Coronal Mass Ejections

*Tuesday 7 September 2021 11:13 (13 minutes)*

We conducted a statistical analysis of the dimming events associated with Earth-directed coronal mass ejections (CMEs) that were observed in quasi-quadrature by the SDO and STEREO satellites. We derived the properties of the dimmings as observed above the limb by STEREO EUVI and compared them with the mass and speed of the associated CMEs. The unique satellite constellation allowed us to compare our findings with the results from Dissauer et al. (2018, 2019), who studied these events observed against the solar disk by SDO AIA. Such statistics is done for the first time and confirms the close relation between characteristic dimming and CME parameters for the off-limb viewpoint. We find that the dimming areas are typically larger for off-limb observations while the total extreme ultraviolet intensity decrease is similar ( $c \sim 0.6$ ). Parameters describing the total dimming extent, i.e., off-limb area and total brightness, strongly correlate with the CME mass ( $c \sim 0.7-0.8$ ). The derivatives of these parameters show a high correlation with the CME speed ( $c \sim 0.6$ ). In addition, we studied whether the coronal dimmings can be used to identify a predominant direction of the CMEs. Using the same set of events, we estimated the dimming growth direction and compared it with modeling results of the CMEs propagation, derived from existing GCS reconstructions and provided in catalogs. Our findings suggest that coronal dimmings have the potential to provide early estimates of the Earth-directed CMEs parameters, relevant for space weather forecasts, for satellite locations at both L1 and L5.

**Authors:** CHIKUNOVA, Galina (Skolkovo Institute of Science and Technology); Dr DISSAUER, Karin (NWRA & University of Graz); Dr PODLADCHIKOVA, Tatiana (Skolkovo Institute of Science and Technology); Prof. VERONIG, Astrid (Kanzelhöhe Observatory for Solar and Environmental Research & Institute of Physics, University of Graz)

**Presenter:** CHIKUNOVA, Galina (Skolkovo Institute of Science and Technology)

**Session Classification:** Poster Session 4.5

**Track Classification:** Session 4 - From Radio to Gamma Rays: Near-Sun Manifestations and Triggering of Solar Flares and Coronal Mass Ejections