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Poster
It is generally known that the majority of fast CMEs are linked to type-II radio bursts, which are caused by magnetohydrodynamic (MHD) shocks in the solar corona. On the other hand, the lack of type-II radio bursts is not unusual. In this work, we compare radio loud (RL) and radio quiet (RQ) rapid Coronal Mass Ejections (CMEs) with velocities more than or equal to 900 km/s during Solar Cycle 24 (2008– 2021). We were able to identify 143 events with a known source origin on the visible disc (Earth view) out of the 309 rapid CMEs. Using CMEs running-difference pictures we were able to identify the related flares/CMEs for 143 occurrences. The RQ and RL groups have 70 and 73 events, respectively, out of these 143 events. These RL and RQ sets are identified using Wind/WAVES and CALLISTO measurements. We examined the potential for CME-CME and streamer-CME interaction. We present in this work the key distinctions between RL and RQ CMEs as well as the fundamental causes of the radio silence of rapid CMEs. Only 25% of RQ CMEs and no pre-CME interaction were observed in the LASCO field of view, in contrast to over 90% of RL CMEs that interacted with streamers and/or pre-CMEs. Based on observational data, it was shown that a significant density perturbation or interaction raises the likelihood of producing type-II radio emissions from the shock of RL CMEs.
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