

Kalpesh

Ghag

Department of Physics, University of Mumbai

Author-Anil Raghav

Affiliation-Department of Physics, University of Mumbai, Vidyanagari, Santacruz (E), Mumbai 400098, India

Author-Neha Kushe

\affiliation{Department of Physics, University of Mumbai, Vidyanagari, Santacruz (E), Mumbai 400098, India}

Author-Sneha Vengurlekar

Affiliation-Department of Physics, University of Mumbai, Vidyanagari, Santacruz (E), Mumbai 400098, India

Author-Ankush Bhaskar

Affiliation-Space Physics Laboratory, Vikram Sarabhai Space Centre, ISRO, Thiruvananthapuram 695022,

Kerala, India

Author-Vinit Pawaskar

Affiliation-Department of Physics, University of Mumbai, Vidyanagari, Santacruz (E), Mumbai 400098, India

Author-Omkar Dhamane

Affiliation-Department of Physics, University of Mumbai, Vidyanagari, Santacruz (E), Mumbai 400098, India

Author-Zubair Shaikh

Affiliation-Space Sciences Laboratory, University of California, Berkeley, CA 94720, USA

Author-Prathmesh Tari

Affiliation-Department of Physics, University of Mumbai, Vidyanagari, Santacruz (E), Mumbai 400098, India

Author-Kishor Kumbhar

Affiliation-Department of Physics, University of Mumbai, Vidyanagari, Santacruz (E), Mumbai 400098, India

Author-Greg Hilbert

Affiliation-Department of Physics, University of Mumbai, Vidyanagari, Santacruz (E), Mumbai 400098, India

Oral

(Student Speaker)

Abstract: Interplanetary coronal mass ejections (ICME) are large-scale eruptions from the Sun and prominent drivers of space weather disturbances, especially intense/extreme geomagnetic storms. Recent studies by our group showed that ICME sheaths and/or magnetic clouds (MC) could be transformed into a planar magnetic structure (PMS), and we speculate that these structures might be more geo-effective. Thus, we statistically investigated the geo-effectiveness of planar and non-planar ICME sheaths and MC regions. We analyzed 420 ICME events observed from 1998 to 2017, and we found that the number of intense (?100 to ?200 nT) and extreme (<?200 nT) geomagnetic storms are large during planar ICMEs (almost double) compared to non-planar ICMEs. In fact, almost all the extreme storm events occur during PMS molded ICME crossover. The observations suggest that planar structures are more geo-effective than non-planar structures. Thus, the current study helps us to understand the energy transfer mechanism from the ICME/solar wind into the magnetosphere and space-weather events.

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