



Predicting the magnetic structure of interplanetary magnetic clouds and their sheath regions: Space weather perspective

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Magnetic clouds and their turbulent sheath regions drive the majority of intense space weather storms. The magnitude and the details of the magnetic storm (timing, affected current systems, response of the high energy radiation belt electron fluxes, etc.) depend strongly on the magnetic topology of the CME flux rope and whether the sheath region makes a significant contribution. Sheath regions are particularly geoeffective due to their large-amplitude magnetic field fluctuations and high Alfvén Mach numbers, which may enhance solar wind – magnetospheric coupling efficiency. In this presentation I will present examples of space weather responses driven by different CME structures to demonstrate the necessity to develop detailed prediction models/scenarios for different magnetic field configurations and characteristics. The constraints for solar observations and models will be also discussed.