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## Challenges in forecasting space weather consequences of coronal mass ejections

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Intense space weather storms are caused dominantly by coronal mass ejections (CMEs). Their ability to drive significant disturbances in the near-space environments at the Earth and other planets of the solar system is owed to their strong magnetic fields, sustained southward field direction and high solar wind speeds. The magnetic field in CMEs is however difficult to estimate in advance due to the lack of some crucial observations in the solar corona, intrinsic complexities and often drastic evolution and/or interactions occurring during the propagation through the interplanetary medium. This presentation will give an introduction to key challenges pertaining to achieving accurate long-lead time ( $< 0.5$  days) forecasting of the magnetic fields in the heliosphere in two key CME substructures; its turbulent and compressed sheath region and a flux rope where field changes are more organised. Then, an overview of the recent developments in data-driven modelling efforts to estimate the magnetic properties in CME flux rope will be discussed.

**Primary author:** KILPUA, Emilia (University of Helsinki)

**Presenter:** KILPUA, Emilia (University of Helsinki)

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