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A 3D MHD Model for Metis CMEs

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High resolution and high cadence coronagraphic images from Metis are helping addressing outstanding scientific questions on the structure an propagation of CMEs.
At the same time, these observations are opening up new opportunities to observationally constrain existing models and to develop a new generation of advanced, complex models that combine lower and outer coronal domains.

In this work we present a CME MHD model where a CME lifts off from the solar surface in a domain where we have assembled a potential force free field with a solar wind and a transition region plasma distribution that we can tune to to match the Metis pre-CME estimations for temperature, density and plasma speed.
Starting from this initial condition for the whole 3D solar corona up to 15 Rs and including thermal conduction, radiative losses, and coronal heating we can model the propagation of a specific using as inputs the time of the corresponding synoptic magnetogram and the active region identified as source of the flux rope ejection.
The CME triggering is modelled as a simple shear between opposite polarities.
I will present some preliminary results of this modelling approach on the CME observed by Metis on April, 25th 2021.

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