REMOTE-SENSING OBSERVATIONS OF ERUPTING CORONAL MASS EJECTIONS

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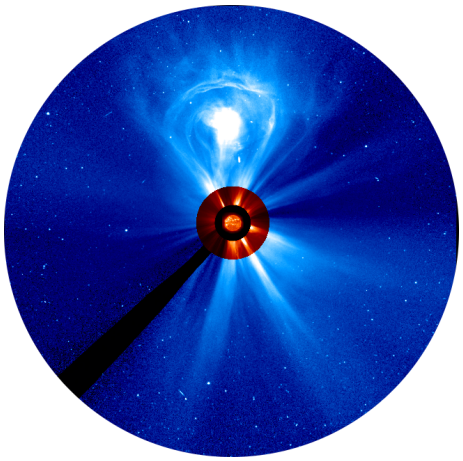
Coronal mass ejections (CMEs) are huge explosions of plasma and magnetic field from the Sun. They are the main drivers of intense magnetic storms and various space weather phenomena at Earth. An important parameter that defines the ability of a CME to drive a geomagnetic storm is the north-south component of the magnetic field. However, current space weather forecasting methods allow to measure directly and routinely the magnetic fields of CMEs only when they reach the Lagrange point L1, located near Earth. There is no practical method to measure the magnetic structure of CMEs routinely in the outer corona.



The magnetic structure of CMEs can however be inferred based on the properties of the CME source region characteristics, obtained through remote-sensing observations. Such structures include Hα filaments, extreme-ultraviolet coronal arcades, X-ray sigmoids, and various nearby coronal and photospheric features. These properties can be used to reconstruct observationally the magnetic structure of CMEs at the moment when they leave the Sun.

We present here examples of CMEs for which we have determined their magnetic properties when launched from the Sun by using a synthesis of indirect proxies based on the multiwavelength remote-sensing observations described above. Then, we compare the predicted CME configurations with the structures detected *in situ* near Earth.