

# **MAGNETIC FLUX AND HELICITY OF ACTIVE REGIONS IN THE SUN EARTH SYSTEM**

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Magnetic helicity is one of the few invariant of magnetohydrodynamics. This property has important consequences for the Sun Earth system. The excess of magnetic flux and magnetic helicity, stored in the solar corona by emerging flux through the solar surface, have to be expelled by coronal mass ejections (CMEs). Recent studies confirm that the source active regions of CMEs have the same helicity sign as the one of the corresponding magnetic clouds in the geospace. I will emphasis on morphological signatures of the sign of the magnetic helicity in emerging flux. However global magnetic helicity of active regions can also be quantitatively computed by different approaches. The use of magnetic helicity density maps, showing mixed polarities in active regions, can now explain the few remaining contradictive cases.

magnetic helicity , coronal mass ejection, magnetic cloud

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