

Subject : The Sun

Title : The Sun and Its Observation Techniques

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Outline :

The Sun is our nearest star, and we can observe its variability driven by magnetic fields. While the Sun is one of many ordinary stars, its proximity makes it a unique object that we can observe in detail with both high temporal and spatial resolution. These observations have revealed the formation of magnetic structures like sunspots, the generation of the corona—a high-temperature atmosphere—and explosive phenomena such as solar flares and coronal mass ejections (CMEs). These phenomena result from magnetohydrodynamic (MHD) processes driven by the strong coupling between surface convection and intense magnetic fields. I will introduce the basics of magnetic activity and the MHD physics behind these phenomena. Finally, I will present observation techniques for measuring magnetic fields using ground-based and space-based missions.

Learning objectives :

Obtain a basic understanding of solar magnetic activity and the underlying MHD physics.
Learn observation techniques for solar activity and explore future prospects.

Textbooks and references :

The Sun: An Introduction (2nd edition), M. Stix