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Magnetic self-organization and reconnection in the solar atmosphere

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Observations revealed many types of solar eruptions, including solar flares, coronal mass ejections (CMEs), jets, and X-ray bright points. They are all associated with magnetic energy release in a timescale about tens of Alfven travel time. Therefore, the key to the understanding of these eruptive phenomena is how the magnetic energy is accumulated and how it is released. Whereas it has been well established with extensive investigations that magnetic reconnection is responsible for the magnetic energy release, the power-law distributions of several parameters of these solar eruptions tend to indicate that the magnetic field in the solar atmosphere is a self-organized system. In this talk, I will show what we have known and what we are eager to know about the magnetic self-organization and magnetic reconnection, with the hope that laboratory plasma experiments can shed some light on them.

References

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