
Key Physics of Prominence Eruption : Models and Observations

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Abstract

Prominence eruption is a key physical process in eruptive flares (i.e., CME related flares), and thus important for space weather research. Since erupting prominence often has a helical structure, it can be said that the erupting prominence is a kind of plasmoid (or flux rope in 3D space). We will discuss the prominence eruption as a prototype of the plasmoid ejection in reconnection dynamics, and will argue basic physics of reconnection (i.e., flares): why and how rapid energy release become possible via reconnection associated with plasmoid ejection (i.e., prominence eruption). In this sense, the prominence eruption is important not only in solar flares, but also in magnetospheric substorms and magnetically confined fusion plasmas. In this talk, we will discuss physics of prominence formation, its stability, and triggering mechanism of prominence eruption, and review recent studies of prominence eruption from both theoretical and observational points of view.

Keywords: magnetohydrodynamics, reconnection, plasmoid, flares

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