

Magnetic Reconnection in Emerging Active Regions

Shin Toriumi, shin.toriumi@nao.ac.jp, National Astronomical Observatory of Japan, Tokyo, Japan.

Solar active regions (ARs), in particular newly emerging ARs, exhibit magnetic reconnections of many scales from catastrophic activity phenomena such as solar flares and CMEs to arcsec-sized brightening features known as Ellerman bombs. This is because the developing ARs harbor a wide variety of magnetic processes including flux emergence and cancellation. Numerical and observational studies have shown that the small-scale, low-atmospheric reconnection in the sheared magnetic structure in an AR may lead to the triggering of large-scale flare reconnection, resulting in the ejection of a magnetic flux rope. On the other hand, utilizing the Hinode, IRIS and SDO data, we found that the small-scale reconnections repeatedly launch the collimated plasma flows (cool jets) above a newly emerging AR. In this talk, I will report on our recent results of numerical and observational studies on the emerging ARs and reconnection events, and discuss what we can learn from the comparison between the simulations and the observations.