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Energy Build-Up by Emerging Flux Process

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The role of emerging flux in the onset of flare and coronal mass ejections has two aspects: energy built-up and triggering. The newly emerging flux from the convection zone supplies the magnetic energy and helicity into upper atmosphere. The emerging fluxes often undergo magnetic reconnection with pre-existing magnetic field in the corona and produce microflares and jets. In longer time scale, the continuous emergence of new flux and the shearing motion at the photosphere accumulate the magnetic free energy in the active region. What triggers the sudden release of the accumulated energy is still controversial, but an emerging flux is one of the candidates of triggering agent. Development of high performance computers has enabled us to carry out MHD simulations in three dimension to investigate the physical processes of emerging flux and its interaction with pre-existing coronal field. In this talk I will review the recent numerical simulations on this issue.