Magnetohydrodynamic Model of Dark Filament Eruption and Arcade Flaring

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We performed a 2.5-dimensional magnetohydrodynamic simulation of dark filament eruption and arcade flaring in the solar corona. It is based on the quadruple magnetic source model treated by Uchida(1980), and recently getting supports from the observations by Yohkoh. The result of the simulation are summarized as follows. In the quadruple source field, which is energized by the photospheric motion, a certain amount of gas (dark filament gas) can be supported quasi-stably in the region of the current sheet and prevents the magnetic reconnection. After the dark filament gas is squeezed out both upwards (dark filament rise) and downwards (down-pressed S-shaped X-ray filament) by external triggers, the magnetic reconnection can occur and release the stored magnetic stress energy. Thus, it is shown that this model can explain several key characteristic features of dark filament eruption and the following arcade flaring found by Yohkoh.