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# Flares from the Supermassive Black Hole in our Galaxy

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Flares from the supermassive black hole in our Galaxy Sgr A* have been routinely observed by multiwavelength observations [e.g., 1,2]. These observations, especial the recent GRAVITY observations, suggest that the flares are associated with hotspots around Sgr A*. But the nature of these flares remains largely unclear, despite many theoretical efforts.

Motivated by our statistical analysis of X-ray flares from Sgr A* [3], we propose an MHD model to explain the multiwavelength flares from Sgr A* by analogy with models of solar flares/coronal mass ejections [4,5,6]. In this scenario, the magnetic energy is gradually accumulated in the magnetic loops until a threshold is reached, after which a flux rope enclosed by the loop will be ejected from the surface of the accretion flow with the help of magnetic reconnection in the current sheet. In this catastrophic process, the magnetic energy is partially converted into the energy of non-thermal electrons to power flares.

We have calculated the dynamical evolution of the hotspots, and the associated flare light curves, polarizations, the spectra based on detailed radiative transfer, and find that our model can explain the main features of the observations. The application of this model to other accreting black hole systems with similar flaring activities will also be briefly discussed.

References:
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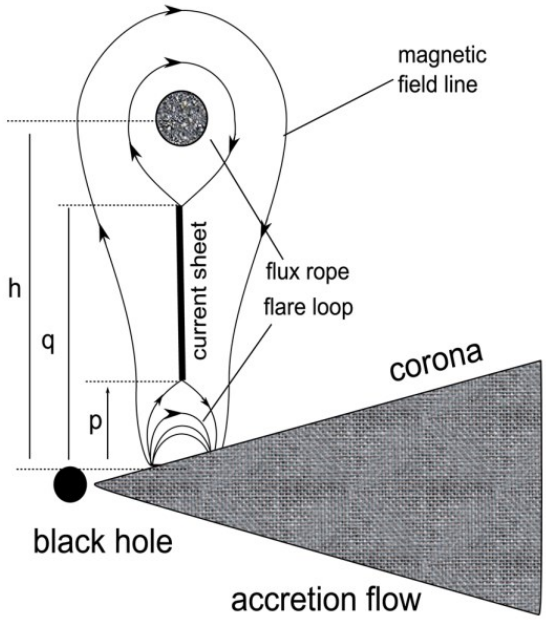


**Figure 1.** Illustration of our flare model. The solid lines with arrows present the magnetic field lines. The flux rope is denoted by a shaded circle enclosed by the closed field lines. The current sheet region is represented by the thick solid line. The non-thermal electrons accelerated by the reconnection from the current sheet flow into the flux rope and flare regions, which can power the multiwavelength flares.