# Flares and CMEs/GiantArcades are based on the same Physics?

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Yohkoh discovered that in the quiet region on the sun the giant arcade formation sometimes occurs, which shows a temporal X-ray intensity change similar to the flare, though the absolute magnitude of its X-ray intensity is much lower than that of the flare .

From the simultaneous observation of giant arcades in soft X-rays and in Halpha, it is found that the arcade formation is related to filament eruptions and/or coronal mass ejections (CMEs).

Because the arcade show a cusp-shape like the flare cusp, we think the magnetic reconnection is also occurring in the arcade formation as in the flare.

We study the temporal change of the temperature T and the emission measure EM in the arcade formation using soft X-ray images taken with Yohkoh/Soft X-ray Telescope.

We estimated the arcade electron densities of many arcade events, and compared them with the pre-flare coronal electron densities N.

With these quantities(T,EM,N) we comfirmed the following theory.

Shibata and Yokoyama suggested that for solar and stellar flares the magnetic flux density B and the flare loop length L can be estimated from peak flare temperature,T, peak flare emission measure,EM, and the pre-flare electron density,N.

In the case of the steller flares, it's difficult to measure these quantities(B,L,M) because of the lack of spatially resolved images of steller flares.

Using the observational value of the arcade and the other data of the solar flares, we compared the theoretical flare loop length with the observed flare/arcade loop length, and found a good correlation between them.

This result supports the theory of Shibata and Yokoyama and is the indirect evidence that flrares and arcades are heated by the magnetic reconnection mechanisms.