Photospheric cancellations and filament formations

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We statistically examined simultaneous events of a cancellation on the photosphere and a filament formation in H-alpha images and an EUV brightening in one event.

Filament formations and simultaneous cancellations on the photosphere were observed in some papers. Various formation models based on simultaneous photospheric cancellations were proposed.

But there were very few statistical studies about cancellations on the photosphere and filament formations.

We statistically examined cancellations on the photosphere and filaments formation in both active regions and in quiet regions.

We used H-alpha images taken by SMART and photospheric magnetograms of SOHO/MDI.

Both in active and quiet regions, we could observe simultaneous events, filament formations without cancellations on the photosphere, and cancellations without filament formations. More formations without cancellation on the photosphere were observed in quiet regions than in active regions.We think a filament formation without cancellations can not occur in flux emerging models but can occur in reconnection models.

Addition to the association of photospheric cancellations and filament formations, we determined EUV brightening in a filament formation without cancellations. We observed an apparent EUV brightening. This supports the reconnection models, too.

From these results, we discuss flux emerging model and reconnection models in active regions and quiet regions respectively.