Triggering process of the X1.0 confined flare in the great active region NOAA 12192

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In this study, we clarify the triggering process of the X1.0 flare produced in the great active region (AR) 12192 on 2014 October 24. AR 12192 had very complicated magnetic structure and six X-class flares occurred in the AR. The AR showed complicated shape of the polarity inversion lines (PILs), and the X1.0 flare produced three flare-ribbons unlike the standard two-ribbon flare. However, it was a *confined flare* which does not produce any CMEs.

We analyzed magnetic field data and coronal/chromospheric images obtained by Hinode and SDO. We superposed strong coronal/chromospheric emission contours on magnetic field images, and investigated the spatio-temporal correlation between them. We also investigated the non-potentiality by measuring the angle between the potential field and the transverse field. We compared the observed features and the coronal magnetic field lines, which were extrapolated by the NLFFF method (Inoue+2014), in order to clarify the trigger process of the flare.

As a result, we identified the *flare-trigger field* of the X1.0 flare, and found that the triggering process was two-step from the preceding C9.7 to the X1.0 flare. The triggering process of the flare can be explained by the model of the Reversed Shear (RS) type proposed by Kusano+2012. We also found that the flare-trigger field was located slightly off of the PIL although the numerical simulation of Kusano+2012 assumed the flare-trigger field just above the PIL. Therefore, our results indicate that a RS-type flare-trigger can work even if the flare-trigger field is displaced from the PIL. Moreover, we discussed the causality between the two-step flare-trigger process and CMEs by considering the critical height of the torus instability. We propose that both the stable condition to the torus instability and the RS-type flare-trigger process could contribute to prohibiting these flares form erupting.