M47a **Quantitative estimation of the energy flux in a white light flare kernel observed by Hinode, IRIS, SDO, and RHESSI**

Kyoung-Sun Lee (NAOJ), Shinsuke Imada (Nagoya Univ.), Kyoko Watanabe (National Defense Academy), Yumi Bamba (JAXA), David H. Brooks(George Mason University)

An X1.6 flare occurred at the AR 12192 on 2014 October 22 around 14:06 UT was observed by Hinode, IRIS, SDO and RHESSI. We analyze a bright kernel which produces a white light flare (WLF) with continuum enhancement and a hard X-ray (HXR) peak. Taking advantage of the spectroscopic observations of the IRIS and EIS, we measure temporal variation of the plasma properties in the bright kernel through the chromosphere and corona. We found that explosive evaporation were observed when the WLF occurred, even the intensity enhancement in hotter lines is quite weak. Those temporal correlation of the WLF, HXR peak, and evaporation flows indicate that the WLF could be produced by accelerated electrons. To understand the white light emission processes, we calculate the deposited energy flux from the non-thermal electrons observed by RHESSI and compare it to the dissipated energy estimated by the chromospheric line (Mg II triplet) from the IRIS. The deposited energy flux from the non-thermal electrons is about $9.2 \times 10^{10}\,\mathrm{erg\,cm^{-2}\,s^{-1}}$ when we consider the cut-off energy 20 keV. The estimated energy flux from the temperature changes in the chromosphere measured from the Mg II subordinate line is about $4.6 - 6.7 \times 10^{9}\,\mathrm{erg\,cm^{-2}\,s^{-1}}$, $\sim 15 - 22\%$ of the deposited energy. By comparison of these estimated energy fluxes we conclude that this continuum enhancement might be directly produced by the non-thermal electrons.