

## Sun, Space Weather, and Solar-Stellar Connection



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### Observations of the Homologous Flares by AR 13386 on the 5th and 6th of August 2023.

Flares are the most energetic events on the sun, powered by magnetic reconnection. Here, we study the three homologous flares produced by AR 13386 on the 5th and 6th of August 2023, using imaging and spectroscopy from different instruments and vantage points to study the thermodynamic and elemental abundance evolution.

We calculate DEMs from AIA/SDO observations to establish the temporal evolution of the flare thermodynamics, which is then supplemented by the temperatures calculated using GOES and XSM/Chandrayaan-2 data. Temperature profiles from all three calculations match and follow a similar trend.

We use XSM data to capture changes in the elemental abundance. Reliable abundance calculations cannot be done for the first flare as the spectrum has contributions from other flaring regions. From the STIX/Solar Orbiter, only the loops of the flare arcade are visible, and the footpoints are occulted, while FERMI observes both footpoints and loops. We compare this data and probe the interaction between loops and footpoints of the flare.

The second flare shows an anomalous increase in the elemental abundances during the impulsive phase before dropping to the photospheric values and then returning to coronal values in the decay phase. The third flare does not show an anomalous increase in elemental abundance.

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#### Theme

Energetic Phenomena

**Primary author:** KATHAIT, Deepak (IUCAA,Pune)

**Co-authors:** RAMAPRAKASH, A.N. (IUCAA, Pune); TRIPATHI, Durgesh (IUCAA, Pune); SRIVASTAVA, Nandita (Udaipur Solar Observatory Physical Research Laboratory); ROY, Soumya (IUCAA, Pune); PADINHATTEERI, Sreejith (MCNS, MAHE); UPENDRAN, Vishal (LMSAL)

**Presenter:** KATHAIT, Deepak (IUCAA,Pune)