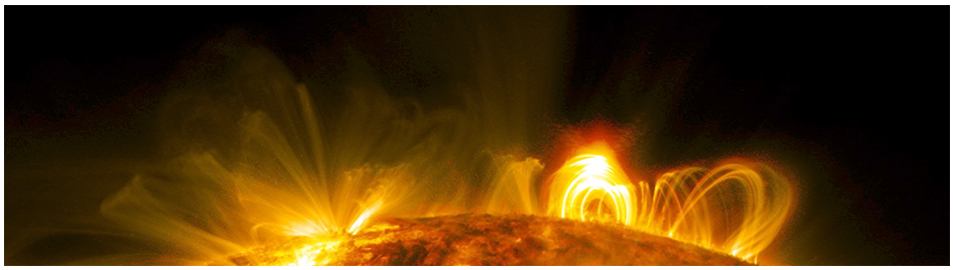

Contribution ID: **37** Type: **Poster**

Solar Flare Plasma Temperature: Relating GOES-XRS Flux to Chandrayaan-2 XSM Spectra

Thursday 18 November 2021 09:45 (1 hour)

Solar flare plasma temperatures are fundamental to our understanding of flare dynamics and energy transport. GOES-XRS broadband flux ratios are often used to estimate flare temperature. Though an approximation, a single temperature isothermal plasma is still a reasonable approximation for many applications. We compare the flare temperatures (single or two temperatures) derived using spectra from the Solar X-ray Monitor (XSM) onboard Chandrayaan-2 and that from GOES-16 XRS in order to derive a possible empirical relation that can be used to refine the GOES-XRS temperature estimate. XSM operates at 1-15 KeV overlaps the energy range of the GOES X-ray Spectrometers (XRS), enabling a comparison between the two instruments. Flares, of GOES class A and above, seen on-disk for both instruments are considered. We obtain the disk-integrated flux values for the duration of the flares from the GOES '1-minute average flux'products and temperature from the spectral fitting of the XSM flare data using a chianti based model. We find a strong correlation between the two parameters, thus providing us with a method to derive temperature estimates for even low classes of flares from the GOES broadband flux values. Previous studies have shown that the temperature of flares scales with the GOES class, for M and above. Even though GOES detects low-class of flares, due to the contribution of high background at low flux, temperature calculated from current models, such as the SolarSoft routine 'goes_chianti_tem', saturates to the instrumental limit value. XSM spectra through this empirical relation enable using GOES XRS flux to derive flare temperatures over a larger dynamic range.

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