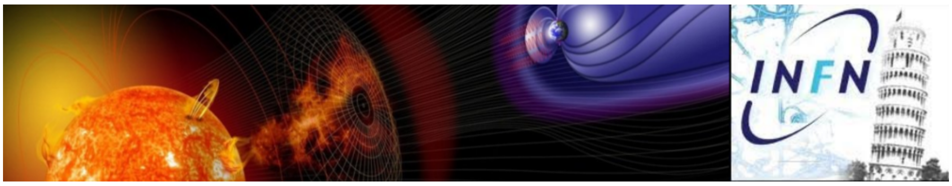

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Current progress on MinXSS-RHESSI joint DEMs

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Solar flares efficiently heat coronal plasma to temperatures of 10-50 MK, and accelerate electrons to energies of hundreds of keV up to hundreds of MeV. It is still poorly understood how much of the plasma heating is from collisions by the accelerated electrons versus direct heating from the reconnection process that powers the flare. It is also not well determined how much energy is contained in the nonthermal electrons, as the low-energy extent ("cutoff") of the non-thermal population is difficult to characterize while overshadowed by the thermal population at those energies.

An accurate characterization of the full thermal electron population is critical both to understanding plasma heating processes and to accurately measuring the "residual" nonthermal electron population to determine its energetics. Hard X-rays (HXRs; 5-100 keV) probe both the nonthermal population and the hot, ~10-50 MK plasma, but are most sensitive to the hottest portion of the temperature distribution. Soft X-rays (SXRs; 1-10 keV) offer deeper insight into cooler, ~2-25 MK temperatures, as well as elemental abundances that further probe the coronal or chromospheric plasma origins. Complete 1-100 keV spectral coverage thus also provides the comprehensive 2-50 MK temperature coverage necessary for full characterization of both thermal and nonthermal electron populations.

From May 2016 to May 2017, over 10 M-class flare and over 100 C-class flares were simultaneously observed in SXRs by the MinXSS-1 CubeSat and in HXRs by RHESSI. We present current progress in joint analysis of simultaneous MinXSS and RHESSI X-ray spectra to determine flare temperature distributions (differential emission measure, DEM) and abundances of key low-FIP elements, as well as the residual nonthermal emission and associated low-energy cutoff. We discuss the details of the joint analysis technique, and its application to a number of jointly-observed flares to determine thermal and nonthermal parameters and their evolution.

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