

Mary
Hanson
SWRI
Sam Honan
Hope Reynolds
Alex Fitzgerald
Amir Caspi
and the STEAM Team
Oral
(Invited Talk)

The Student Thermal Energetic Activity Module (STEAM) is a collaboration between the University of Colorado Boulder's Colorado Space Grant Consortium (COSGC) and Southwest Research Institute (SwRI). The instrument will be hosted on the PUNCH NFI spacecraft. STEAM will be exploring how coronal plasmas are heated in flares and active regions by measuring abundances of low First-Ionization Potential (FIP) elements using a soft X-ray (SXR) spectrometer. Coronal abundances of low-FIP elements (e.g. Mg, Si, Fe, Ca) are enhanced by a factor of about 4 above chromospheric values. Measuring the abundances of low-FIP elements at different temperatures provides insight into the origins of heated plasma. X-ray emissions, including spectral lines and continuum, provide the most direct diagnostic signatures of hot coronal plasma. STEAM's SXR spectrometer will capture X-ray emissions from 0.5 to 20 keV with a spectral resolution of less than 0.3 keV FWHM. STEAM will utilize forward modeling with bremsstrahlung and atomic emission databases to fit physical parameters such as temperature and elemental abundance to observed spectral data. These elemental abundances allow STEAM to infer the origin of plasma for flares and active regions. We will present the STEAM science motivation, design, and future outlook.

Presentation file

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