Metcalf Travel Award Follow-Up Report

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My research encompasses spectral analysis and radiative-hydrodynamic modeling of stellar flares. I received my PhD in Astronomy from the University of Washington, where I did my doctoral research on flares in M dwarf stars. I was recently a NASA Postdoctoral Program Fellow in the Heliophysics Science Division at NASA's Goddard Space Flight Center. Now as a Research Associate with the University of Maryland, I am continuing my work on solar flares at NASA/GSFC.

Oral Contribution: The Spectral Energy Distribution of White-Light Emission during Solar (and Stellar) Flares

The ultraviolet and optical (white-light) continuum emission during the impulsive phase of solar flares often represents the majority of the radiated flare energy, yet its spectral energy distribution remains largely unconstrained especially around the Balmer jump region. Hinode and IRIS have provided new spectral data of the white-light emission, which can be compared to detailed predictions from state-of-the-art radiative-hydrodynamic models.

IRIS has observed many flares with high spatial and spectral resolution in the far- and near-ultraviolet wavelength regimes. Using the flare data from IRIS and the radiative-hydrodynamic code RADYN, we seek to determine whether white-light emission is consistent with optically thin hydrogen recombination radiation, or with hot (T=9000 K) blackbody emission as for more energetic flares on active M dwarf stars. We presented the first results of a large observational and modeling project using IRIS data to constrain the brightness of the Balmer continuum emission, which complements recent results in the optical wavelength regime from Hinode/SOT. Measurements of the continuum intensity are combined with constraints on chromospheric mass motions inferred from emission line broadening. Using the RADYN code, we modeled the atmospheric response to nonthermal electron beams in the March 29th, 2014 X1 flare. We found that the white-light emission in this flare can be explained by optically thin hydrogen recombination radiation from a heated, dense chromospheric condensation.

Other Activities: At this conference, I had many stimulating and helpful conversations with experts in the solar physics community. I made progress on current collaborative projects and initiated new ones. I was exposed to the cutting edge research in a broad range of topics including flares, prominences, the solar wind, and quiet Sun phenomena. My experiences at this conference will have long-lasting benefits for my career in solar physics. I am extremely grateful for the Metcalf Travel Award for the opportunity to attend this exciting and unique conference.