

## **Inferring nonthermal particle characteristics from thermal emission signatures**

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**Abstract.** Much work has been done in characterizing the nonthermal particle beams found in flares. Most of this work has concentrated on the interpretation of hard X-ray (HXR) emission. While HXR emission does have a direct connection to the nonthermal particle beam, there are other emission mechanisms that can also provide insight into the nature of the nonthermal beam. In the impulsive phase of solar flares the primary source of plasma heating is collisions between the nonthermal particles and the ambient, thermal plasma in the flare loop. The properties of the nonthermal particle beam directly affect the heating of the thermal plasma. Thus the thermal emission (e.g., soft X-rays) can also yield clues to the properties of the nonthermal beam. Recent flare modeling in the dissertation of Winter (2009) makes specific predictions about the behavior of the soft X-ray (SXR) emission from the flaring loop, depending on the properties of the nonthermal particle beam. As an initial test of the applicability of these predictions to real flares, we have undertaken a comparison to HXR and SXR observations from the Yohkoh mission. We present preliminary results from the analysis of Yohkoh-observed solar flares, pursuant to the predictions of the model.