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Simulated thermal signatures of nonthermal particle distributions

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Abstract. A series of flares are simulated using the HyLoop code. HyLoop combines the effects of a hydrodynamic, thermal plasma and high-energy, non-thermal particles in a self-consistent model that uses the nonthermal particle collisions as momentum and energy inputs to the thermal model and the thermal plasma as an evolving target for the nonthermal particles. The nonthermal particles for each flare are drawn from different probability distributions in energy and pitch-angle. Accurate simulations of XRT filter responses, differential emission measures, and hard X-ray emission in multiple passbands are made for each flare and simulation error statistics provided. The simulated emissions show distinctive signatures that can be used to discriminate between nonthermal particle injection profiles.