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Forward modeling of nanoflares: What can we learn from IRIS?

Nanoflares are widely thought to play an important role in coronal heating. Heating events at this energy scale, however, cannot be observed directly by current instrumentation. This has driven the need for modeling so that we can infer their properties from observations. To what extent, though, are the processes of energy release in nanoflares similar to those in flares and microflares? Are they simply less energetic versions of larger flares, or are there physical differences? We examine the different plasma responses for heating at different energy scales driven primarily by thermal conduction, Alfvénic waves, and electron beams, and review their properties. We present the case of a microflare observed with IRIS, Hinode, and RHESSI, where many of the features can be reproduced through detailed hydrodynamic modeling. We then scale down the energy release in the hydrodynamic model to directly test the impact on observables, particularly those from IRIS. We comment on future instrumentation, and stress the need for high cadence observations.