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Radiation Properties of Cool Coronal Condensations

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Cool plasma condensations in the corona manifest themselves as various types of prominences, loop structures, flare loops, coronal rain etc. They can be highly dynamical, exhibiting fine structures down to resolution of current instruments. Nowadays they are modeled using multidimensional MHD simulations. But to compare with observations, a non-LTE radiative-transfer spectral synthesis is needed. We will review current approaches to synthesize the spectra and monochromatic images from up-to-date MHD models. The methods are based on multispecies-multilevel non-LTE modeling which provides the overall excitation-ionization structure. An important ingredient is the illumination from the surrounding solar atmosphere. As a result one can determine the partial ionization of the plasma and optically-thick radiative losses through the whole volume, both being critical for realistic MHD simulations. We will review the modern approaches and discuss future prospects.

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