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45th SYMPOSIUM ON SAFETY AND QUALITY IN SPACE ACTIVITIES (D5)
Space Weather and Effects: Prediction, Analysis and Protection (3)

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LOCATING HIGH TEMPERATURE-LOW EMISSION PLASMA IN THE CORONA

Abstract

In order to increase the safety of those involved in space exploration we must first be able to predict solar activity. To do this we must understand how the sun behaves and what mechanisms trigger explosive events such as solar flares. Solving the coronal heating problem by discovering the permanent heating mechanism in the corona will expand our knowledge of the sun's activity to help us predict these events. An important parameter to unlocking the solar coronal heating problem is to detect the frequency of the heating. Low-frequency heating, such as that caused by magnetic reconnection, would have significantly high temperatures (6MK) and low emission measure plasma, while high-frequency heating, such as wave heating, would not. It is very difficult to detect high-temperature, low-emission measure plasma in the corona. However, analyzing spectral data from the Solar Ultraviolet Measurements of Emitted Radiation (SUMER) Spectrometer on the Solar and Heliospheric Observatory(SOHO) may be the key to detection of this plasma. Although the wavelength range of SUMER contains several high-temperature spectral lines, very few active region observations were made due to detector concerns. Using the active region observations available, we will determine the spectral line intensities created by high temperature spectral lines observed by SUMER and generate a differential emission measure to determine if there is the high temperature plasma required for low-frequency heating.