USING OBSERVATIONS OF NON-IDEAL VELOCITIES TO TEST THE HYPOTHESIS THAT RECONNECTION HEATS THE ACTIVE REGION CORONA

Kai E. Yang\textsuperscript{1,2}, Dana Longcope\textsuperscript{2}, Yang Guo\textsuperscript{1}, M. D. Ding\textsuperscript{1}

\textsuperscript{1}School of Astronomy and Space Science, Nanjing University, China
\textsuperscript{2}Montana State University, Bozeman, MT, USA

Many coronal heating mechanisms have invoked magnetic reconnection in some role. Testing such a mechanism requires a method of measuring magnetic reconnection coupled with a prediction of the heat delivered by reconnection at the observed rate. We propose a heating model based on the discrepancy between the footpoint motion and the local plasma motion, so-called non-ideal motion. A novel method is proposed to measure this velocity discrepancy by combining a time sequence of 3D magnetic field with maps of photospheric velocity. This heating rate is used to predict density and temperature at points along an equilibrium loop and in turn is used to synthesize emission in EUV bands. We perform this analysis using a sequence of HMI vector magnetograms of a particular AR and compare synthesized images to observations of the same AR by SDO. We also compare differential emission measure inferred from those observations to that of the modeled corona.