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Energy Release in a Magnetized Resistive Corona Driven by Continuous Footpoint Motions YI-MIN HUANG, Center for Magnetic Self-Organization, University of Wisconsin, DALTON SCHNACK, Department of Physics, University of Wisconsin and Science Applications International Corporation, ELLEN G. ZWEIBEL, Department of Physics and Department of Astronomy, University of Wisconsin, ZORAN MIKIC, Science Applications International Corporation — The solar corona is a highly conducting plasma (Lundquist number $S \sim 10^{10-13}$). As such, Ohmic dissipation is negligible except within thin current filaments. In his corona heating model, Parker suggests that thin current filaments can be induced in a magnetized corona via the shuffling of the field lines driven by continuous footpoint motions. We study this model with a three-dimensional resistive MHD code. A uniform and straight initial magnetic field is slowly driven by random footpoint motions, and the subsequent energy release is observed. Since the realistic parameters of the solar corona are unattainable in the simulation, one of the main objectives is to establish a scaling law of the energy release rate with respect to the Lundquist number, so that the simulation results can be extrapolated to the real system.

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