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Heating and Turbulence from Magnetic Reconnection, Kinetic Alfven Waves and Whistler Waves in the Solar Corona[1] CYNTHIA CORREA, WENDEL HORTON, Institute for Fusion Studies, University of Texas at Austin — Theory and simulations are used to investigate the expected heating and reconnection rates due to tearing modes and kinetic Alfvén waves (KAW) in configurations with magnetic islands and flux tube loops of various heights/diameters and collisionality regimes. A simple nonlinear electron scale magnetic reconnection model for the magnetic flux and electrostatic potential dynamics is used, as detailed in W. Horton, J.-H. Kim, and F. Militello, Physics of Plasmas **14**, 012902 (2007). Collisional terms, electron inertia dispersion and ion polarization currents are included in the dynamical equations. Whistler waves are excited by the small scale dynamics around the X-points, which are investigated with nonlinear wave equations for heating, acceleration and energy transport. Energy densities and Alfvénic Poynting fluxes are evaluated. The fractions of the released magnetic energy that goes into plasma flows, plasma heating and radiation are estimated. This analysis informs solar corona heating theories.

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