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**Anomalous resistivity due to high-frequency waves at the X-line during magnetic reconnection** J. JARA-ALMONTE, H. JI, PPPL, W. DAUGHTON, LANL, V. ROYTERSHTEYN, SciberQuest, M. YAMADA, J. YOO, W. FOX, PPPL — One major consequence of magnetic reconnection is the efficient transfer of energy from magnetic fields to plasma particles. During collisionless reconnection, the decoupling of the field from the plasma is known to occur only within the localized ion and electron diffusion regions, however predictions from fully kinetic simulations do not agree with experimental observations on the size of the electron diffusion region, implying a different reconnection mechanism. Using 3D, fully explicit kinetic simulations with a realistic and unprecedentedly large separation between the Debye length and the electron skin depth, we show that high frequency electrostatic waves ($\omega \gg \omega_{LH}$) can exist within the electron diffusion region. These waves generate small-scale turbulence within the electron diffusion region which acts to broaden the layer. Anomalous resistivity is also generated by the turbulence and significantly modifies the force balance. In addition to simulation results, initial attempts to measure high frequency fluctuations (f $\leq$ 1 GHz) in the Magnetic Reconnection Experiment (MRX) will be presented.

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