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Dimensionless, Rare, Single Spacecraft, Scalar, Observable Properties of the Electron Diffusion Region of Collisionless Magnetic Reconnection JACK SCUDDER, University of Iowa, WILLIAM DAUGHTON, LANL — PIC simulations are used to demonstrate five observable, single spacecraft, dimensionless, scalar properties of the Electron Diffusion Region (EDR) of Collisionless Magnetic Reconnection (CMR). These properties are the (i) the demagnetization of the thermal electrons exceeds unity; (ii) the perpendicular electron mach number exceeding unity; (iii) the electron anisotropy exceeding 2.5; (iv) the electron agyrotropy exceeding 0.5; (vi) near alignment ($<5^\circ$) of one of the non-gyrotropic electron pressure tensor's eigenvectors with the direction of the perpendicular electric field. These scalar dimensionless properties are shown to characterize the electron diffusion regions identified by the standard theoretical diagnostics that would not be readily possible (even with finite differencing) from multiple spacecraft measurements. Similar diagnostics may be useful in identifying EDR's in 3D PIC codes and for use in triggering high data recovery on future space missions.

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