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A Lagrangian kinetic model for collisionless magnetic reconnection CESARE TRONCI, Department of Mathematics, University of Surrey — A new fully kinetic system is proposed for modeling collisionless magnetic reconnection. The formulation relies on fundamental principles in Lagrangian dynamics, in which the inertia of the electron mean flow is neglected in the expression of the Lagrangian, rather than enforcing a zero electron mass in the equations of motion. This is done upon splitting the electron velocity into its mean and fluctuating parts, so that the latter naturally produce the corresponding pressure tensor. The model exhibits a new Coriolis-force term, which emerges from a change of frame in the electron dynamics. Then, if the electron heat flux is neglected, the strong electron magnetization limit yields a hybrid model, in which the electron pressure tensor is frozen into the electron mean velocity.

Cesare Tronci
Department of Mathematics, University of Surrey

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