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**The effects of magnetic fields and non-classical transport on long pulse laser-plasma interactions** CHRISTOPHER RIDGERS, ROBERT KINGHAM, ALEXANDER THOMAS, Imperial College London — Predictive simulation of long-pulse laser plasma interactions is crucially dependent on accurate modelling of heat transport in the presence of magnetic fields and the dynamics of these fields. The applicability of Braginskii's transport theory to such interactions has been determined using the first fully kinetic, nanosecond time-scale, Vlasov-Fokker-Planck simulation code including self-consistent magnetic fields and hydrodynamic plasma expansion. Recently D.H. Froula et al have experimentally investigated the heat flow in a laser-gas jet plasma in the presence of externally applied B-fields. We have shown that for the largest magnetic fields externally applied in such experiments (12T), the rate of advection of the B-field is dramatically enhanced by the Nernst effect and leads to the re-emergence of non-locality even if the initial value of the magnetic field strength is sufficient to localize the transport.

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