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The Hall number across a van Hove singularity ILYA ESTERLIS, AKASH MAHARAJ, Stanford University, YI ZHANG, Cornell University, BRAD RAMSHAW, Los Alamos National Laboratory, STEVEN KIVELSON, Stanford University — In the context of the relaxation time approximation to Boltzmann transport theory, we examine the behavior of the Hall number, n_H, of a metal in the neighborhood of a Lifshitz transition from a closed Fermi surface to open sheets. A non-analytic dependence of n_H on the electron density is universal in the high field limit, but at low fields the behavior is non-singular and non-universal. We find, however, that for suitable choice of band-parameters a singular change in the low-field n_H occurs near a continuous nematic-order-driven Lifshitz transition. This behavior of n_H is similar to that seen in recent experiments in the high temperature superconductor $YBa_2Cu_3O_{7-x}$, where a sharp drop in n_H occurs below optimal doping.

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