## Transport in Chern-Simons-Matter Theories

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(Duration and Location are subject to irreducible jitter)

The frequency-dependent longitudinal and Hall conductivities --- $\sigma_{xx}$ and $\sigma_{xy}$ --- are dimensionless functions of $\omega/T$ in 2+1 dimensional CFTs at nonzero temperature. These functions characterize the spectrum of charged excitations of the theory and are basic experimental observables. We compute these conductivities for large N Chern-Simons theory with fermion matter. The computation is exact in the 't Hooft coupling $\lambda$ at $N=\infty$. We describe various physical features of the conductivity, including an explicit relation between the weight of the delta function at $\omega=0$ in $\sigma_{xx}$ and the existence of infinitely many higher spin conserved currents in the theory. We also compute the conductivities perturbatively in Chern-Simons theory with scalar matter and show that the resulting functions of $\omega/T$ agree with the strong coupling fermionic result. This provides a new test of the conjectured 3d bosonization duality. In matching the Hall conductivities we resolve an outstanding puzzle by carefully treating an extra anomaly that arises in the regularization scheme used.

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