

This continuum theory has a conserved momentum  $\mathbf{P}$ , and  $\chi_{\mathbf{J},\mathbf{P}} \neq 0$ , and so the resistivity  $\rho(T) = 0$

Memory functions: in the presence of perturbations which lead to  $\dot{\mathbf{P}} \neq 0$  (also tested holographically, via “graviton masses”):

$$\rho(T) = \chi_{\mathbf{J},\mathbf{P}}^{-2} \lim_{\omega \rightarrow 0} \text{Im} \frac{\chi_{\dot{\mathbf{P}},\dot{\mathbf{P}}}(\omega)}{\omega} .$$