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Thermoelectric properties of $Na_{0.68}CoO_2$ on a 2D triangular lattice MICHAEL R. PETERSON, JAN O. HAERTER, B. SRIRAM SHASTRY, University of California Santa Cruz — Na_xCoO_2 at $x = 0.68$ is a material with important and interesting thermopower. Using a new formalism for computing thermal response functions, via the response to dynamical temperature gradients, in the high frequency limit a nearly frequency independent term is identified for the thermopower S^*, the Lorentz ratio L^*, and the dimensionless figure of merit Z^*T. We calculate, via exact diagonalization for small systems, S^*, L^*, and Z^*T, at all temperatures for the t-J model on a 2D triangular lattice exploring the model parameters relevant to the experiments by I. Terasaki *et al*, (PRB **56**, R12685 (1997)) and Y. Wang *et al*, (Nature **423**, 425 (2003)). Our objective is to understand the (large) magnitude of the thermopower, and its remarkable sensitivity to a magnetic field. We also consider the hypothetical and interesting case of the opposite sign of hopping $t \to -t$.

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