Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Thermoelectric coefficient for the 3d FCC lattice Hubbard model[1]

LOUIS-FRANÇOIS ARSENAULT, Departement de Physique and RQMP, Universite de Sherbrooke, Sherbrooke, QC, Canada, B. SRIRAM SHASTRY, Physics Department, University of California, Santa Cruz, CA 95064, USA, PATRICK SÉMON, A.M.S TREMBLAY, Departement de Physique and RQMP, Universite de Sherbrooke, Sherbrooke, QC, Canada — Thermal transport in strongly correlated materials impacts on both fundamental science and applications. Since calculations based on the standard Kubo formula have proven extremely difficult, Shastry and coworkers [1] have developed two novel approximate ways to obtain the thermopower in interacting systems. One method is based on the high-frequency limit and includes vertex corrections. The other, based on ideas of Kelvin, is purely thermodynamical. We compare the results of both methods for the Hubbard model, the prototype of correlated systems, on a lattice that is of great interest for applications, the 3d FCC. This lattice is frustrated even with only nearest- neighbor hopping. In addition to being 3d, each site has 12 nearest-neighbors. We thus used dynamical mean field theory with CTQMC in the hybridization expansion as the impurity solver [2] to study the Seebeck coefficient as a function of the band structure, doping and temperature for different interaction strengths. Connexions with experiments are made and propositions for good candidate for applications are discussed. [1] B.S. Shastry, Rep. Prog. Phys. 72, 016501 (2009) [2] P. Werner et al., Phys. Rev. Lett. 97, 076405 (2006)

[1]Supported by: NSERC, CRC, CIFAR, NSF and DOE.

Louis-François Arsenault
Departement de Physique and RQMP,
Universite de Sherbrooke, Sherbrooke, QC, Canada

Date submitted: 06 Dec 2009 Electronic form version 1.4