Violation of Onsager reciprocity in underdoped cuprates? VICTOR YAKOVENKO, University of Maryland, CHANDRA VARMA, University of California at Riverside, AHARON KAPITULNIK, Stanford University — One of the canons of condensed matter physics is the Onsager reciprocity principle for systems in which the Hamiltonian commutes with the time-reversal operator. Recent results of measurements of the Nernst coefficient [1] in underdoped YBa$_2$Cu$_3$O$_{6+x}$, together with the measurements of the anisotropy of conductivity and the inferred anisotropy of the thermopower, imply that this principle is violated [2]. The probable violation and its temperature dependence are shown to be consistent with the loop-current phase which has been directly observed in other experiments. The violation is related directly to the magneto-electric symmetry of such a phase in which an applied electric field generates an effective magnetic field at right angle to it and to the order parameter vector, and vice versa.


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