

Abstract Submitted  
for the MAR11 Meeting of  
The American Physical Society

**Fluctuation Relations for Currents**<sup>1</sup> NIKOLAI SINITSYN, Theoretical Division, Los Alamos National Laboratory, ALEXEI AKIMOV, Department of Chemistry, Rice University, VLADIMIR CHERNYAK, Department of Chemistry, Wayne State University, MICHAEL CHERTKOV, Theoretical Division, Los Alamos National Laboratory — We consider a non-equilibrium statistical system on a graph or a network. Identical particles are injected, interact with each other, traverse, and leave the graph in a stochastic manner described in terms of Poisson rates, possibly strongly dependent on time and instantaneous occupation numbers at the nodes of the graph. We show that the system demonstrates a profound statistical symmetry, leading to new Fluctuation Relations that originate from the supersymmetry and the principle of the geometric universality of currents rather than from the relations between probabilities of forward and reverse trajectories.

<sup>1</sup>NSF/ECCS-0925618, NSF/CHE-0808910 and DOE at LANL under Contract No. DE-AC52-06NA25396.

Nikolai Sinitsyn  
Theoretical Division, Los Alamos National Laboratory

Date submitted: 02 Nov 2010

Electronic form version 1.4