



The University of Chicago
Department of Statistics
Seminars for Second Year PhD Students

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“Electric Networks and Probability on Graphs”

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ABSTRACT

Electric current on a network was found to follow a random walk of electrons on that graph. This provides a concise probability model for electrics. Further study in the connection between these two subjects revealed that ideas in electrics help us to solve the recurrence problems in random walk on graphs. For a random walk with infinite states, the classic method works for some symmetric graphs, but it becomes complicated even with slight change of the graph. The way using an electric network is based on the energy of the system. Rayleigh’s Monotonicity Law provides a useful way to estimate the energy. Furthermore, a symmetric random walk on a space is related to the differential structure.