1096-92-188 **Linh Ngoc Khanh Huynh*** (linh.n.huynh@rice.edu). *Mathematically Decomposing an Ecological Network into Self-Sustaining Building Blocks.*

An ecological network can be represented by a directed, weighted graph whose nodes are the compartments of the network, edges are the flows or transactions of materials, and weights of the edges are the flow rates. Studying systemwide properties of some complex ecological networks can be easier when we study those properties in the networks' building blocks instead. However, it would not be ecologically meaningful if compartments and flows are studied separately because they exist together as a network. Hence, we propose a new building block called flux, which is the smallest process in an ecological network that can theoretically sustain itself. It is either a simple cycle or simple chain. Any ecological network, regardless of size or complexity, has a finite unique set of fluxes. I am going to present how to decompose any ecological network into fluxes using a linear algebra approach, a computational approach, and a probabilistic approach and also discuss the flux coefficient uniqueness issue of these methods. This individual project was done through a joint Research Experiences for Undergraduates (REU) program between University of Georgia and the Mathematical Biosciences Institute thanks to a support from the National Science Foundation. (Received August 15, 2013)