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Alexandru Hening*, alexandru.hening@tufts.edu, and **Dang Hai Nguyen**. *When does the competitive exclusion principle hold in stochastic environments?*

The Competitive Exclusion Principle is a fundamental principle in ecology. It states that a number of species competing for a smaller number of resources cannot coexist. However, it has been observed empirically that in many instances this principle gets violated. Hutchinson famously coined the term ‘the paradox of the plankton’: an instance where a large number of phytoplankton species coexist while competing for a very limited number of resources. It has been shown theoretically that in some instances environmental fluctuations can help competing species coexist. In this talk I will showcase how different types of environmental stochasticity help preserve or violate the Competitive Exclusion Principle. The dynamics of the populations will be modeled by stochastic differential equations, piecewise deterministic Markov processes, or stochastic difference equations.

I will give conditions under which the competitive exclusion principle holds as well as provide examples of when it fails. The results show that stochastic factors have a strong effect on competitive exclusion and, therefore, should not be neglected. (Received September 12, 2018)