1173-92-78 **Jiaqi Cheng*** (jzc0146@auburn.edu), **Xiaoying Han** and **Peter Chesson**. *Dynamics of the lottery competition model in stochastic environments.*

In order to investigate the role of environmental fluctuation on the ecological competition, we study the lottery competition model. First a diffusion approximation for the fraction of sites occupied by each adult species is derived as the continuum limit of a classical discrete-time lottery model. As a result, a system of nonlinear stochastic differential equations (SDEs) are developed as the diffusion approximation for the discrete lottery model. Then, the existence and uniqueness of positive and bounded global solutions, as well as long term dynamics for the solution are investigated, from which sufficient conditions for the coexistence of species in the sense of stochastic persistence are established. Moreover, in the 2-D case, we have obtained a time-dependent limiting process under certain conditions. Finally, Numerical simulations are presented to illustrate the theoretical results. (Received September 15, 2021)