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Burstiness in Viral Bursts: How Stochasticity Affects Spatial Patterns in Virus-Microbe Dynamics YU-HUI LIN, BRADFORD P. TAYLOR, School of Physics, Georgia Inst of Tech, JOSHUA S. WEITZ, School of Biological Sciences and School of Physics, Georgia Inst of Tech — Spatial patterns emerge in living systems at the scale of microbes to metazoans. These patterns can be driven, in part, by the stochasticity inherent to the birth and death of individuals. For microbe-virus systems, infection and lysis of hosts by viruses results in both mortality of hosts and production of viral progeny. Here, we study how variation in the number of viral progeny per lysis event affects the spatial clustering of both viruses and microbes. Each viral "burst" is initially localized at a near-cellular scale. The number of progeny in a single lysis event can vary in magnitude between tens and thousands. These perturbations are not accounted for in mean-field models. Here we developed individual-based models to investigate how stochasticity affects spatial patterns in virus-microbe systems. We measured the spatial clustering of individuals using pair correlation functions. We found that increasing the burst size of viruses while maintaining the same production rate led to enhanced clustering. In this poster we also report on preliminary analysis on the evolution of the burstiness of viral bursts given a spatially distributed host community.

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