1156-60-81 **Denis D Patterson***, Department of Mathematics, Brandeis University, 415 South Street, Waltham, MA 02453, and **Simon A Levin**, **Carla Staver** and **Jonathan D Touboul**. *Spatial Effects in Savanna Dynamics.*

We introduce two interacting particle systems of vegetation dynamics (one macroscale and one mesoscale) based on the interaction rules from the mean-field Staver-Levin model of forest-savanna-grassland evolution. Using coupling techniques for stochastic jump processes, we show the convergence of these particle systems towards McKean-Vlasov jump processes — processes solving a stochastic differential equation with self-consistent jump rates depending on the statistics of the solution. The generalized Kolmogorov equations of these processes are systems of integro-differential equations (IDEs) which are more amenable to analysis than the original particle systems and constitute nonlocal generalizations of the classical Staver-Levin model. Mathematical and numerical analysis of the resulting IDEs reveals a rich phenomenology in the dynamics, namely phase skipping waves of invasion, front pinning, (spatial) multistability and pattern formation. Furthermore, some of the solutions we identify predict novel mechanisms for the real-world forest-savanna transition which can be observed in empirical data. (Received January 13, 2020)