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Evolution of dispersal in advective patchy environments

The classical Lotka-Volterra competition model predicts competition exclusion occurs when the competition is strong, and species can coexist when the competition is weak. In a spatially heterogeneous environment, the dispersal rates of species and the spatial heterogeneity could change or uphold the outcome of the competition. We show in a two-species Lotka-Volterra competition model in a patchy advective environment, where the species are subject to both directional drift and undirectional random dispersal between patches, under what conditions on the advection and random dispersal rates that a mutating species can or cannot invade the resident species. This is a joint work with Shanshan Chen, Zhisheng Shuai and Yixiang Wu.