1016-35-66 **Yuan Lou*** (lou@math.ohio-state.edu), 231 west 18th Ave., Columbus, OH 43210, and **Robert Stephen Cantrell** and **Chris Cosner**. *Advection-mediated coexistence of competing species.*

We study a Lotka-Volterra reaction-diffusion-advection model for two competing species in a heterogeneous environment. The species are assumed to be identical except their dispersal strategies: one disperses by random diffusion only, the other by both random diffusion and advection along environmental gradient. When the two competitors have the same diffusion rates and the strength of the advection is relatively weak in comparision to that of the random dispersal, we show that the competitor that moves toward more favorable environments has the competitive advantage, provided that the underlying spatial domain is convex, and the competitive advantage can be reversed for certain non-convex habitats. When the advection is strong relative to the dispersal, we show that both species can invade when they are rare, and the two competitors can coexist stably. The biological explanation is that for sufficiently strong advection, the "smarter" competitor will move toward more favorable environments and is concentrated at the place with maximum resources. This leaves enough room for the other species to survive since it can live upon regions with less resources. (Received January 26, 2006)