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Diffusivity Bounds for Some Durrett–Rogers Polymer Processes

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The Durrett–Rogers polymer processes (see R.T. Durrett, L.C.G. Rogers, PTRF vol. 92 (1992) 337–349) are diffusions with long memory due to path-wise self-interaction given in terms of local time and/or its derivatives. They are phenomenologically closely related to self-interacting random walks, such as the "true" (or, myopic) self-avoiding walk. The long time asymptotic scaling behavior of these processes is far from being well understood. For an interesting class of D-R polymers we identify stationary and ergodic distributions of the "environment as seen from the moving particle" and we give bounds on the diffusivity of the displacement.

This is joint work (in progress) with Pierre Tarres and Benedek Valkó.