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Universal Properties of Population Dynamics with Fluctuating Resources SAYAK MUKHERJEE, Virginia Tech, HANS-KARL JANSSEN, Heinrich-Heine-Universitat, Dusseldorf, BEATE SCHMITTMANN, Virginia Tech — Starting from the well-known field theory for directed percolation, we describe an evolving population, near extinction, in an environment with its own nontrivial spatio-temporal dynamics. Here, we consider the special case where the environment follows a simple relaxational (Model A) dynamics. Two new operators emerge, with upper critical dimension of four, which couple the two theories in a nontrivial way. While the Wilson-Fisher fixed point remains completely unaffected, a mismatch of time scales destabilizes the usual DP fixed point, suggesting a crossover to a first order transition from the active (surviving) to the inactive (extinct) state.

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