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A Two-Species Social Dominance Model SWAPNIL JAWKAR, Department of Physics, Virginia Tech, GEOFFREY ADAMS, Department of Neurobiology, Duke University, UWE C. TÄUBER, Department of Physics, Virginia Tech — We study the general properties of a stochastic two-species social-domination model defined on a d -dimensional lattice. The introduction of spatial degrees of freedom and allowance of stochastic fluctuations surprisingly does not invalidate the deterministic mean-field picture. In the active state, where the dominant and submissive species coexist, no patch formation is observed, with correlation lengths restricted to a few lattice sites. Oscillations seen in the submissive population density are strongly damped and restricted to a small section of the parameter space. Observations are explained to be a result of the two-particle reactions being restricted to the same social group.

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