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A convection-diffusion model for gang territoriality

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**Highlights**

- A two-species agent-based model for gang territorial development undergoes a phase transition from a well-mixed to a segregated state as graffiti avoidance parameter increases.
- A continuum version of the model, a system of convection-diffusion equations, is formally derived from the microscopic model.
- The phase transition is studied at both the discrete and the continuum levels.
- Using interactions only through a mediating field, the model exhibits coarsening similar to the Cahn-Hilliard equation.

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