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Exploring the onset of collective motion in self-organised trails of social organisms

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• The emergence of self-organised trails between two specific target areas in collective motion of social organisms is investigated by means of an agent-based model.

• An increase in the efficiency of navigation between the target areas is described.

• The shift, from the from the diffusive to the directed motion, is quantitative characterised.

• A crossover point, which corresponds to the minimal number of individuals necessary for the onset of collective motion, is identified.

• The scaling behaviour, as a function of the environment size, is clearly described by means of a finite-size scaling analysis.

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