

Abstract Submitted
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Least action and entropy considerations of self-organization in Benard cells GEORGI GEORGIEV, WPI and Assumption College, GERMANO IANNACCHIONE, WPI — We study self-organization in complex systems using first principles in physics. Our approach involves the principle of least action and the second law of thermodynamics. In far from equilibrium systems, energy gradients cause internal ordering to facilitate the dissipation of energy in the environment. This internal ordering decreases their internal entropy in order to obey the principle of least action, minimizing the product of time and energy for transport through the system. We are considering the connection between action and entropy decrease inside Benard cells in order to derive some general features of self-organization. We are developing mathematical treatment of this coupling and comparing it to results from experiments and simulations.

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