A Model of Convecting Fluids. The Lorenz Model

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In the 60s meteorologist Edward Lorenz was interested in modeling convection in the atmosphere . To describe this process, he used first order nonlinear equations with three variables. The variables of these equations were different characteristics of the convective flux. Based on these equations he sought to demonstrate that even a very simple set of equations may have solutions, whose behavior is essentially unpredictable. In the 80s, thanks to computer technologies, it became possible to study the Lorenz system solutions for the long times. In this way was discovered the possibility of stochastic processes of paths in low- degree-freedom systems. Now, when attention is paid to the study of chaos, researching the systems of Lorenz is formed as subgroup of chaos theory.

My work concerns at finding chaotic regimes of Lorenz system for the parameters of the system's different meanings with the help of computer technologies. I have independently created several plots and animation of chaotic regime.