

Research of Newman's Biological Evolution Model

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The paper presents both analytical and numerical researches of a biological evolution model with a coherent noise. We specified the conditions for the mean-field approximation applicability. We noted the inaccuracy of some model's analysis data which is caused by violation of these conditions. We showed the power law statistics of extinctions for a wide class of stress distributions. We found the relation between initial and resulting values for power laws stresses and demonstrated the emergence of logarithmical correction of power density with fixed exponent for non-power law stresses. A finite-size scaling for simulated densities to confirm the accuracy of theoretical calculations was performed.

Keywords: *biological evolution, extinctions, adaptation, coherent noise, stress model, power laws.*

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