

Punctuated equilibrium model of biological evolution

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Abstract

A punctuated equilibrium model of ecosystem evolution is discussed. The ecosystem is consisting of N species and we have analysed an effect of the Bak-Sneppen predator-prey food-chain [1] self-organization on nucleotide content of evolving species. Deviation of the genomic nucleotide fraction from its equilibrium value was playing the role of the fitness parameter, B , in Bak-Sneppen model. Our finding (to be published in [2]) is, that the higher is the value of the threshold fitness, during the evolution course, the more frequent are large fluctuations in number of species with strongly differentiated nucleotide content. An extension of this self-organization mechanism to genome evolution has been shortly discussed.

References

- [1] P. Bak and K. Sneppen, *Phys. Rev. Lett.* **74**, 4083 (1993)
- [2] M. Dembska, M.R. Dudek, D. Stauffer, *Food-chain competition influences gene's size*, to appear in **Physica A**

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