

AKSOE 15: Dynamics of Groups and Organizations IV

Time: Thursday 17:45–18:45

Location: H8

AKSOE 15.1 Thu 17:45 H8

Log-periodic oscillations due to discrete effects in complex networks — •JULIAN SIENKIEWICZ, PIOTR FRONCZAK, and JANUSZ HOLYST — Faculty of Physics and Center of Excellence for Complex Systems Research, Warsaw University of Technology, Koszykowa 75, 00-662 Warszawa

We show how discretization of distances affects two major characteristics in complex networks: internode distances (measured as the shortest number of edges between network sites) and average path length. Direct effects of such discretization are log-periodic oscillations of above quantities. The effect occurs both in numerical network models as well as in such real systems as coauthorship, language, food and public transport networks. Analytical description of these oscillations based on the properties of the hidden variables in complex networks fits well numerical simulations. We consider a simple case of network optimization problem, arguing that discrete effects lead to a nontrivial solution that can be important for real-world systems.

AKSOE 15.2 Thu 18:15 H8

About Unified Mathematical Approach for Different Ideologies — •YURI YEGOROV — Institute for Advanced Studies, Vienna,

Austria

In order to build a formal link between neoclassical economics and alternative social structures and ideologies (nationalism, Marxism), it makes sense to extend individualistic utility function by capturing some altruism. Individual utility in a nationalist society can be modelled as a weighted sum of own utility plus the sum of utilities of all members of the nation. In Marxist society, there is also care about common interest, but instead of average, this should be the utility of its poorest member. These utilities allow for non-linear interaction between members of the society. The distribution of wealth matters for both nationalist and Marxist societies, while it does not matter for liberal society. Altruism can bring more stability to the concept of social equilibrium and lead to more robust structures, and it also can explain possible mechanism of emergence of social group. It is possible to show that the prisoner*s dilemma has a good equilibrium when everybody cares also about utility of a partner. If the level of altruism depends on social distance between people, we get the emergence of cooperative zones where the motivation for purely egoistic behaviour disappears. This can explain such historical phenomena as the emergence of ethnic groups, communities and nations.