

L.V. Rozanova¹, A.Y. Temerev², E.V. Myakisheva³

¹*University of Barcelona, Barcelona, Spain*

²*University of Neuchatel, Neuchatel, Switzerland*

³*Omsk State University n.a. F.M. Dostoevskiy, Omsk*

FAST-SLOW VOTER MODEL ON CORE-PERIPHERY NETWORKS

By looking at node states exchange in the voter model as a continuous stochastic process, we are able to use the Fokker–Planck (Kolmogorov) equation to construct this model. The main points of interest to us are the following:

- how the behavior dynamics of two types of nodes can influence each other?
- how the interaction process depends on network structure (in particular, within core-periphery networks)?
- how strong is the impact of rate parameters distributions on the average time to reach consensus, as opposed to the constant values for each group?
- what changes can occur in voting process if the flip rate is changing over time?

To analyze the state exchanging dynamics in two groups – fast and slow nodes, it is possible to build a model in the form of a system of differential equations, which can be analytically investigated in order to identify critical points and possible bifurcations in the system.

Description of the model:

1. Node states exchange in heterogeneous network.
2. Fast-Slow model on the complete network. MF fast-slow model.
3. Voter process on a network with two cliques.

4. Voter process on the two-clique network with distributed fast and slow nodes.
5. Voter process on the heterogeneous-degree network with fast and slow nodes.
6. Voter process on the heterogeneous-degree network with fast and slow nodes with time-dependent flip rate.

Consideration of options for the voter model with fast and slow nodes on networks with heterogeneous core-periphery structure allows us to consider feedback.