

[P20] Reciprocity in spatial evolutionary public goods game on double-layered network

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We study spatial evolutionary public goods game (SEPGG) on double-layered random networks (DRNs) in which each node has one or zero interlink. In these networks imitation and interaction between individuals of opposite layers is established through interlinks. We use a biased imitation process: an agent update his strategy from the neighbor in the opposite layer with probability p . With probability $1 - p$, an agent update his strategy from the neighbor in the same layer. Based on the previous study of SEPGG on single layer [1], we construct 3 types of DRNs for $r_0 < 1$ depending on the average intradegree. When $r_0 > 1$, we find only one type of DRN can be defined. First, we consider SEPGG on the DRN with the same size. From numerical analyses, we find optimal point that has maximum cooperator density on each DRN. The effect of interlink on the DRN are also studied by changing the total number of interlinks. We also studied DRN with different sizes.

Reference

1. Kim, J., Chae, H., Yook, S.-H. & Kim, Y. Spatial evolutionary public goods game on complete graph and dense complex networks. *Sci. Rep.* 5, 9381 (2015).