

Phase transitions in evolutionary space games

Aleksandr Malyutin², Sergei Kolotev^{1,2}, Evgeni Burovski^{1,2}, Sergei Krashakov^{1,3}, and Lev Shchur^{1,2,3}

¹ Science Center in Chernogolovka, 142432 Chernogolovka, Russia

² National Research University Higher School of Economics, 101000 Moscow, Russia

³ Landau Institute for Theoretical Physics, 142432 Chernogolovka, Russia

We study the dynamics of a space evolutionary game based on the prisoners' dilemma. The game features a series of sharp transitions between several regimes, characterized by abrupt changes in the densities of the components and non-trivial geometric rearrangements of the game field. We investigate critical properties of the resulting phase transitions and discuss the geometric properties of the emergent interfaces between components.