Contributed ID number: ... (to be assigned by DynamicsDays2016)

ORAL

Stochastic Detection of an Interaction-Range in Non-Equilibrium Traffic and Granular Flows

Self-organized patterns revealed in many granular, social or socio-physical systems (like vehicular traffic, pedestrian flows) indicate the presence of mutual interaction-forces among individuals. Although there exist several successful researches dealing with theoretical estimations of agent repulsions/attractions, quantitative description of interaction-range for those virtual forces is, without any doubt, a much more difficult task. As is well known, for the afore-mentioned purposes any analysis of correlation coefficients is highly ineffective. Therefore, instead of it we present a novel analytical method for deciding how many immediately neighboring agents (particles, drivers, walkers) influence decision-making procedures of a given agent. Such a method is based on the novel Stochastic Perturbation Theory that quantitatively analyzes deviations between multi-headway distributions calculated for uncorrelated and correlated agents. Applicability of the SPT method will be demonstrated on an extensive set of vehicle-by-vehicle data recorded at the Expressway R1 in Prague (in cooperation with The Road and Motorway Directorate of the Czech Republic).

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Topic 1: **Traffic Flow**

SESSSION: _____