Dynamical Systems Seminar

Date. October 12, 14h30

Place. Room M031

Speaker. Hale Aytaç[1] (CMUP)

Title. Extremes for deterministic and random dynamics

Abstract. The Extremal Index (EI) is an important parameter which measures the clustering of extreme events in stationary processes. It is shown for some certain uniformly expanding (deterministic) systems that there is a dichotomy based on whether the rare events correspond to the entrance in small balls around a periodic or a non-periodic point. In fact, either there exists EI in (0, 1) around (repelling) periodic points or the standard Extreme Value Laws (EVLs) hold around non-periodic points, in which case the EI is equal to 1. We show this dichotomy for balls, centred at every possible point, under the assumption that there exists sufficient decay of correlations of observables in some Banach space against all L^1-observables. Then we consider the random perturbations of uniformly expanding systems, such as piecewise expanding maps of the circle. We show that for additive absolutely continuous (w.r.t. Lebesgue) noise, the dichotomy vanishes and the EI is always 1. As a result of the link between EVLs and Hitting Time Statistics (HTS)/ Return Time Statistics (RTS), we get our results by means of the first return time from a set to itself.

Remark. Coffee with the speaker is served after the talk (15h30 - 16h00)

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