Contribution ID: **94** Type: **poster**

What drives transient behaviour in complex systems?

We study transient behaviour in the dynamics of complex systems described by a set of non-linear ODE's. Destabilizing nature of transient trajectories is discussed and its connection with the eigenvalue-based linearization procedure. The complexity is realized as a random matrix drawn from a modified May-Wigner model. Based on the initial response of the system, we identify a novel stable-transient regime. We calculate exact abundances of typical and extreme transient trajectories finding both Gaussian and Tracy-Widom distributions known in extreme value statistics. We identify degrees of freedom driving transient behaviour as connected to the eigenvectors and encoded in a non-orthogonality matrix T_0. We accordingly extend the May-Wigner model to contain a phase with typical transient trajectories present. An exact norm of the trajectory is obtained in the vanishing T_0 limit where it describes a normal matrix.

Based on:

https://arxiv.org/abs/1705.08758

Primary author: GRELA, Jacek (LPTMS, Universite Paris-Sud)

Presenter: GRELA, Jacek (LPTMS, Universite Paris-Sud)