DY 38: Data Analysis and Stochastic Modeling I (jointly with UP)

Time: Thursday 16:30–17:00 Location: ZEU 255

DY 38.1 Thu 16:30 ZEU 255

Analyzing the phase statistics of phenological records: fluctuations and correlations with temperature — •Diego Rybski, Anne Holsten, and Jürgen P. Kropp — Potsdam Institute for Climate Impact Research (PIK), P.O. Box 60 12 03, 14412 Potsdam, Germany

Phenological timing – i.e. the course of annually recurring development stages in nature – is of particular interest since it can be understood as a proxy for the climate at a specific region; moreover changes in the so called phenological phases can be a direct consequence of climate change. We analyze records of botanical phenology and study their fluctuations which we find to depend on the seasons. In contrast to previous studies, where typically trends in the phenology of individual species are estimated, we consider the ensemble of all available phases and propose a phenological index that characterizes the influence of climate on the multitude of botanical species.

DY 38.2 Thu 16:45 ZEU 255

An advanced method for the estimation of drift and diffusion coefficients from stochastic time series — •Christoph Honisch and Rudolf Friedrich — Institut für Theoretische Physik, Universität Münster, D-48149 Münster

We present a novel iterative method to estimate drift and diffusion coefficients from data of stationary univariate Markov processes $X(t)$. These coefficients are defined as $D^{(n)}(x) = \frac{1}{n!} \lim_{\tau \to 0} \frac{1}{\tau} \langle (X(t+\tau) - x)^n | x = X(t) \rangle$, where n=1,2 corresponds to drift and diffusion coefficients respectively. Our method overcomes the problem of performing the limit $\tau \to 0$ by taking advantage of a recently reported approach [1] to calculate exact finite sampling interval effects on the estimation of drift and diffusion. Therefore, good results are achieved in cases of sparsely sampled time series.

[1] St. J. Lade, Phys. Lett. A **373**, 3705 (2009)