

# Seminar für Systemdynamik und Reibungsphysik

Im Rahmen des Seminars für Systemdynamik und Reibungsphysik spricht

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zum Thema

## **Theory of dynamical systems and applied time-series analysis**

**Zeit:** Mi, 17.11.2010, 16:15 - 17:30 Uhr    **Ort:** Raum M 123 (Gebäude M)

### **Abstract**

The main topic of the lecture is to present specific results obtained by analysis of concrete time series of the natural origin. As is known, a lot of systems (natural, such as atmosphere, or artificial, like stock exchange) because of the extreme complexity cannot be described analytically. In addition, contrary to numerical simulations or analytical analysis, when we deal with experimental data, the phase space, dynamical variables and other characteristics are unknown. Here we have, as a rule, only observable variable(s) or time series. What properties of the analyzed systems we may reconstruct from such time series and what merits it is possible to extract from it?

On the basis of theory of dynamical systems one can get answers and obtain an important information about principal characteristics of the system generated this time series. Moreover, in some cases it is possible to estimate future values of the investigated time series, and these estimations turns out to be functions of the previous values only. Therewith, methods of the probability theory work worse than methods of the theory of dynamical systems. Some examples from experimental physics and economics (financial analysis) are given.