

# Coherent sets in nonautonomous dynamics

Kathrin Padberg-Gehle (Institute of Scientific Computing, TUD)

Transport properties of nonautonomous dynamical systems over a finite-time interval can be described within a probabilistic framework. Of particular interest are coherent sets. These are time-dependent macroscopic structures that hardly mix with the rest of phase space over the considered time span. Such behavior can be observed in many real-world phenomena, including the polar vortex, gyres and eddies in the ocean as well as thermal plumes in convection. Coherent sets can be efficiently detected and approximated within a transfer operator based approach and by recently developed clustering techniques. In this talk, we discuss the theory and numerics of coherent sets constructions and demonstrate their properties in a number of example systems. This is joint work with Gary Froyland (UNSW Australia).