

## **Spectral Analysis and Long-Time Behaviour of a Fokker-Planck Equation with a Non-Local Perturbation**

In this talk I will discuss properties of a Fokker-Planck equation with a non-local, mass preserving perturbation. First I will present results on the spectrum of the unperturbed Fokker-Planck operator in an exponentially weighted  $L^2$ -space. In the next step we will see that in this space the spectrum of the Fokker-Planck operator is not affected by the perturbation. In particular, there still exists a unique (normalized) stationary solution of the perturbed equation. Moreover, the perturbed Fokker-Planck operator generates a strongly continuous semigroup of bounded operators. Any solution of the perturbed equation converges towards the stationary state with exponential rate  $-1$ , the same rate as for the unperturbed Fokker-Planck equation. Moreover, for any  $k \in \mathbb{N}$  there exists an invariant subspace with codimension  $k$  in which the exponential decay rate of the semigroup equals  $-k$ .