

Modelling traffic flow with Fokker-Planck equations

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Traffic flow gives rise to interesting phenomena and problems, e.g. jams and congested flow. We take data measured in Germany on the ring of motorways around Cologne for a macroscopic modelling approach. A Fokker-Planck equation in two dimensions with coefficients which depend on the time of day is used to model the dynamics at every gauging station. We estimate the time-dependent drift- and the diffusion coefficients from the measured data. In order to assess the quality of this model we integrate a corresponding Langevin equation and compare the histogram in phase space of the model data with the original data. The model allows us to obtain information about dynamical properties of the transition from congested flow to free flow and vice versa.