

# Anomalous diffusion in optical lattices and ergodicity breaking

Eric Lutz

*Institut für Physik, Universität Augsburg, D-86139 Augsburg, Germany*

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We present some recent results concerning anomalous diffusion of cold atoms in optical lattices. We show that the linear Fokker–Planck equation which describes the atomic dynamics leads to power-law tail distributions – both in momentum space and in time – with *tunable* exponents. This unique property allows for a smooth transition from Gaussian statistics to Lévy statistics with divergent moments. An explicit correspondence between the divergence of these moments and ergodicity breaking is established.

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