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Linearly edge-reinforced random walks

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Linearly edge-reinforced random walk is a non-Markovian random walk with self-interaction. Using methods from statistical mechanics, methods to prove recurrence of this random walk on certain two-dimensional (and one-dimensional) lattices are presented. I will also present conjectures motivated by Monte Carlo simulations predicting a phase transition between recurrence and transience in dimensions greater than 2.

The talk is based on joint work with Silke Rolles.