Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

"Burnt Bridge" Mechanism of Molecular Motor Motion TIBOR ANTAL, PAUL KRAPIVSKY, Boston University — Motivated by a biased diffusion of molecular motors with the bias dependent on the state of the substrate, we investigate a random walk on a one-dimensional lattice that contains weak links (called "bridges") which are affected by the walker. Namely, a bridge is destroyed with probability p when the walker crosses it; the walker is not allowed to cross it again and this leads to a directed motion. The velocity of the walker is determined analytically for equidistant bridges. The special case of $p = 1$ is more tractable — both the velocity and the diffusion constant are calculated for uncorrelated locations of bridges, including periodic and random distributions.

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Date submitted: 13 Dec 2005 Electronic form version 1.4