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László Babai* (laci@cs.uchicago.edu), **Igor Gorodezky** and **Allie Shapiro**. *It's a long way to recurrence - an extremal problem in the Abelian Sandpile Model.*

The Abelian Sandpile Model is a diffusion process on graphs, the analysis of which has fascinated physicists, mathematicians, and computer scientists for two decades. We study the evolution of the process as it moves from the empty state through *transient* states to a *recurrent* state. Our main question is the maximum number $f(m)$ of steps this process can take as a function of m , the number of edges of the underlying graph. We show that $f(m)$ grows as c^m where c is at least the golden ratio. (Received February 03, 2009)