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**Daniel S. Silver\*** ([silver@southalabama.edu](mailto:silver@southalabama.edu)), Department of Mathematics and Statistics, ILB, University of South Alabama, Mobile, AL 36688, and **Susan G. Williams**. *Periodic Graphs, Spanning Trees and Mahler Measure*.

Motivated by techniques of knot theory and algebraic dynamical systems, we prove several results about graphs  $G$  with free  $Z^d$ -action by automorphisms and finite quotient. For any such graph, a *Laplacian polynomial*  $\Delta(G)$  in  $d$  variables is defined. Its logarithmic Mahler measure  $m(\Delta(G))$  is a growth rate of spanning trees. When  $G$  is a lattice graph, this rate determines the so-called *thermodynamic limit* of  $G$ , usually computed by analytic methods rather than the algebraic ones used here.

We prove that  $m(\Delta(G))$  is minimized by the standard  $d$ -dimensional grid graph  $G_d$ . We prove also that  $m(\Delta(G_d))$  is asymptotic to  $\log 2d$  as  $d$  goes to infinity. (Received September 10, 2015)