1116-05-2112 **Thomas W Tucker*** (ttucker@colgate.edu), Math Dept, Colgate University, Hamilton, NY 13346, and **Jonathan L Gross** (gross@cs.columbia.edu) and **Toufik Mansour** (tmansour@univ.haifa.ac.il). *The recursive structure of genus polynomials for linear families.*

The *genus polynomial* for a finite graph G is the generating function $g_G(z) = \Sigma a_i z^i$, where a_i is the number of imbeddings of G in the surface of genus i. A *linear family* G_n of graphs is formed by taking n copies of the same graph G and forming a path of them by adding edges in the same way between one copy of G and the next; Stahl suggested these families as a case study for genus polynomials. For any such linear family there is a *production* or *transfer* matrix $M(z)$ and initial vector $v(z)$ (all entries are polynomials in z with non-negative integer coefficients) such that the genus polynomial for G_n is $M^n(z)v(z)$. These matrices have been computed by hand for a few small cases and by computer for some larger examples. Almost nothing is known about the entries of $M(z)$ or the behavior of $M^n(z)$. We conjecture that for sufficiently large n all entries of $M^n(z)$ are non-zero. This would imply that the Markov chain associated with $M(1)$ is regular, allowing one to infer the long-run distribution of the different types of imbeddings of G_n. (Received September 21, 2015)