

1135-05-421

**Yichao Chen** and **Jonathan L Gross\*** ([gross@cs.columbia.edu](mailto:gross@cs.columbia.edu)). *Genus polynomials of ring-like graphs with spiders.*

An H-linear sequence of graphs is obtained by binding increasingly many copies of a fixed graph H into a chain. An H-ring-like sequence is formed by binding the two end-copies of H in each such chain, so as to form cycles of copies of H. Within this context, we introduce subgraphs called spiders. Beyond their use in extending a linear graph family to other families whose genus polynomials are amenable to calculation with feasible effort, the spiders allow for a multiplicity of ways to bind the two end-copies of chain. Our main objective herein is to describe a unified method for constructing a homogeneous linear recursion for the genus polynomials of ring-like sequences or linear sequences, with or without spiders. The prevalent approach to genus polynomials heretofore has been to solve a system of simultaneous recursions of partial genus polynomials. Additionally, we prove here that the modes of the genus distribution sequences of several types of ladder-graphs are either the upper-rounding or the lower-rounding of their average genera. (Received September 01, 2017)