1163-05-472 **Jonathan L Gross*** (gross@cs.columbia.edu), Department of Computer Science, Columbia University, New York City, NY 10027, and **Toufik Mansour** and **Thomas W Tucker**.
Partial-Tuality Polynomials, Part 1.

The compositions of Poincaré duality ($*$) and Petrie duality ($\times$) yield a group of operators on maps that include Wilson duality ($*\times*$) and two triality operators ($*\times$ and $\times*$) that are inverses of each other. Ellis-Monaghan and Moffatt have generalized Chmutov's partial Poincaré duality construction for ribbon graphs to the other operators in this group, for which they coined the term *tualities*. The present authors have previously introduced the *partial-$*$ Euler-genus polynomial* that enumerates all the partial-$*$ duals according to Euler-genus. Here we introduce the partial-$\bullet$ polynomials for the other four tualities. Part 1 of this two-part presentation focuses on the effect of the various partial tualities on the monodromy and on how the Euler-genus of a ribbon graph is easily determined directly from the monodromy. We present the symmetric embedding of $K_5 \to S_1$ as a counterexample to our conjecture in a predecessor paper that all partial-$*$ polynomials are log-concave. (Received September 07, 2020)