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Jonathan L. Gross* (gross@cs.columbia.edu), 86 Rittenhouse Circle, Newtown, PA 18940, and
Thomas W. Tucker. *Partial-Triality Polynomials for Ribbon Graphs, Part I.*

The extension of Chmutov's partial-duality construction for $*$ -duality to compositions of $*$ and \times has been described by Ellis-Monaghan and Moffatt. The study of such compositions began with Wilson, and they are collectively called the *Wilson group*. The compositions $*\times$ and $\times*$ are called *trialities*, since $G^{*\times*\times*} = G^{\times*\times**} = G$, for any ribbon graph G . Gross, Mansour, and Tucker have previously defined the *partial-duality polynomials* to be enumerations of all the partial duals of a ribbon graph, according to their Euler genus or genus, and they have calculated formulas for those polynomials, for each of the dualities, for several infinite sequences of ribbon graphs. This paper introduces for each of the two trialities, an analogous *partial-triality polynomial*. There is also a *mixed-triality polynomial* in which either of two partial-triality operators acts on any edge of the ribbon graph. Formulas for the partial-triality and mixed-triality polynomials are calculated for several infinite sequences of ribbon graphs. (Received February 09, 2021)