1073-05-89 **T. Scott Spencer*** (tsspence@unca.edu) and **Neal Stoltzfus**.

The Bollobás-Riordan-Whitney-Tutte Polynomials and the Iterated Two Sum Operation. Preliminary report.

Given a ribbon graph $\mathbb{D}$ and a collection of pointed ribbon graphs $\mathbb{M}_r$for each edge of $\mathbb{D}$, Farmer has defined the generalized iterated parallel connection and iterated two sum. Essentially, this replaces each edge in $\mathbb{D}$ by the chosen ribbon graph (with the edge deleted for the two-sum). Brylawski developed these ideas of series and parallel connections in graph theory and found formulae for their Tutte polynomial (essential for computational complexity results on the Jones polynomial) . We extend these formulae to the topological rank polynomial of Bollobas-Riordan-Whitney-Tutte for ribbon graphs. The explicit formulae are expressed in terms of the three polynomial constituents of the pointed ribbon graph polynomial of Farmer and a two stage decomposition of the base ribbon graph $\mathbb{D}$. (Received July 27, 2011)