1125-VF-1086 **Abdel-Rahman Amr Madkour*** (madkour@stolaf.edu), 1500 St. Olaf Avenue, Northfield, MN 55057, and **Phillip Nadolny** (nadolnyp@stolaf.edu). *Finding Minimal Spanning Forests in a Graph.*

In the computation of multidimensional persistent homology, a popular tool in topological data analysis, a family of planar graphs arises. We have studied the problem of partitioning these graphs in a way that will be useful for parallelizing the persistent homology calculation. Specifically, we desire to partition an edge-weighted, undirected graph G into k connected components, $G_1, \cdots, G_k$. Let w_i be the weight of a minimum spanning tree in component G_i. For our purposes, an ideal partition is one that minimizes $\max\{w_1, \cdots, w_k\}$. This problem is known to be NP-hard in the case of general graphs and we are unable to find this specific problem in the graph partitioning literature. We propose two approximation algorithms, one that uses a dynamic programming strategy and one that uses a spectral clustering approach, that produce near-optimal partitions in practice on a family of test graphs. We present detailed descriptions of these algorithms and the analysis of empirical performance data. (Received September 14, 2016)