1145-55-2592   **Brittany Terese Fasy*** (`brittany.fasy@montana.edu`), **Ahmed Abdelkader**, **Geoff Boeing** and **David L. Millman**. *Local Persistent Homology-Based Distances between Nonplanar Road Networks.* Preliminary report.

Comparing graphs embedded in a metric space is an important task in the field of transportation network analysis. Graphs of interest may represent various networks, including transportation networks (e.g., subway or road networks) or utility networks. In order to compare these networks, we must define a distance measure that takes both spatial proximity and structural similarity into account. We define a topology-based distance between transportation networks that removes the common planarity assumption among theoretical research, thus allowing bridges and tunnels to be represented accurately. The transportation network is modeled as a set of layers, each containing a planar subset of the full network, thus allowing us to employ prior related research on planar graphs in the non-planar setting. This work lays the foundation for using a layered representation of networks for graph comparison. (Received September 25, 2018)