1128-55-250   **Bala Krishnamoorthy** and **Ben Rapone*** (`benjamin.rapone@wsu.edu`). *Minimum Homotopy Area of a Closed Curve.* Preliminary report.

We define and study the minimum homotopy area of generic closed curves in the plane as a measure of their topological complexity. We first choose two distinct points that divide the closed curve into two curves that start and end at these points. Homotopy area is then defined as the area swept by a homotopy defined between the two curves, and the minimum is considered over all possible homotopies for all choices of the pair of points. We study the computational aspects of this problem, where the closed curve has simple crossings (all are 4-way) and is embedded in $\mathbb{R}^2$. Under this settings we are able to reduce the number of choices of terminal points to a set of n^2 pairings, where n is the number of segments (edges) connecting the crossing points of the closed curve. In addition we are able to show that the minimum homotopy area will be an integer linear combination of its regions as defined by the closed curve. We present new approaches to characterize the complexity of this problem, which are based partly on results from contractibility of spaces. (Received February 27, 2017)