1145-92-516   **M. Ulmer** (`mju9999@gmail.com`), **Lori Ziegelmeier** (`lziegel1@macalester.edu`) and **Chad M. Topaz*** (`cmt6@williams.edu`). *Using topological data analysis to assess biological models.*

We use topological data analysis as a tool to analyze the fit of mathematical models to experimental data. This study is built on data obtained from experiments that motion tracked groups of aphids and from two random walk models that were proposed to describe the data [Nilsen et al., PLOS One, 2013]. One model incorporates social interactions between the insects, and the second model is a control model which excludes these interactions. We use computational persistent homology to calculate topological signatures of the experimental data and of the models. Statistical tests on the distances between these topological signatures suggest that the interactive model better describes the data, whereas traditional order parameters used to summarize the experiments give mixed results. (Received September 08, 2018)