1116-92-2714 **Bernadette J Stolz*** (bernadette.stolz@lincoln.ox.ac.uk), **Heather A Harrington** and **Mason A Porter**. *Analysis of fMRI data using methods from network theory and persistent homology (Preliminary Report).* Preliminary report.

The human brain can be studied using networks. One can define the nodes to be different brain regions and the edges between them to be weighted by a measure of similarity of time series of the brain regions to create a so-called *functional network*. This can then be studied using methods from network science or methods from *structural balance theory* which are used to study relationships between negative and positive edges. Another approach to analyse networks is to apply ideas from *computational topology*, a set of algorithmic methods that characterises topological invariants such as connectedness, loops, or holes in high-dimensional data structures. These methods go beyond pairwise connections. In particular, *persistent homology*, a method that consists of a mathematical formalism to explore the persistence of such structures, has led to promising results on neuronal networks. We analyse task-based fMRI data from schizophrenia patients, controls and siblings of schizophrenia patients using both methods from network science and structural balance theory as well as methods from persistent homology. We also look at the effect of fMRI preprocessing steps that are commonly performed on such data on our results. (Received September 22, 2015)