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Paul Bendich, J. S. Marron, Ezra Miller* (ezra@math.duke.edu), **Alex Pieloch** and **Sean Skwerer**. *Persistent homology analysis of brain artery trees*.

Persistent homology measures geometric structures using topological invariants. When the structures are magnetic resonance images of arteries in human brains, persistent homology can record connectedness and approximate looping of the blood vessels in these tree-structured objects at multiple scales. Novel approaches to statistical analysis of a population of these brain images result by summarizing the persistence diagrams in various ways, leading to correlations with covariates such as age and sex that are improved relative to earlier analyses of this dataset. (Received September 16, 2014)