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Yuriy Mileyko* (yury@math.hawaii.edu), Department of Mathematics, University of Hawaii at Manoa, 2565 McCarthy Mall, Honolulu, HI 96822. *Refinement based persistent (co)homology.*

Persistent homology has established itself as one of the main tools of topological data analysis, especially when it comes to point cloud data. In the latter case, the underlying idea is to find homology classes that are present across multiple scales, where the variation of scales is achieved by growing balls around the data points. While this approach has had a great success in many applications, it forces us to consider small scale homological features before any large scale features, which in many cases may lead to longer computation times and noisier results. In this talk we consider an approach where we track changes in homology not for a nested sequence of spaces (e.g. union of growing balls), but for a particular sequence of covers, each next cover being a refinement of the previous one. We will discuss how some theoretical results available for the filtration based persistent homology translate to the refinement based setting, and illustrate our approach on several examples. (Received February 28, 2017)