1154-55-893    **Luis G. Polanco\*** (`polanco2@msu.edu`), 428 South Shaw Ln, Engineering Bldg, Rm. 1515, East Lansing, MI 48824, and **Jose Perea** (`joperea@msu.edu`), 428 South Shaw Lane, Engineering Bldg, Rm 1512, East Lansing, MI 48824. *Coordinatizing Data With Lens Spaces and Persistent Cohomology.*

We introduce here a framework to construct coordinates in *finite* Lens spaces for data with nontrivial 1-dimensional $\mathbb{Z}_q$ persistent cohomology, for $q > 2$ prime. Said coordinates are defined on an open neighborhood of the data, yet constructed with only a small subset of landmarks. We also introduce a dimensionality reduction scheme in $S^{2n-1}/\mathbb{Z}_q$ (Lens-PCA: LPCA), and demonstrate the efficacy of the pipeline $\mathbb{Z}_q$-persistent cohomology $\Rightarrow S^{2n-1}/\mathbb{Z}_q$ coordinates $\Rightarrow$ LPCA, for nonlinear (topological) dimensionality reduction. (Received September 11, 2019)