1135-37-2940   **Boyan Xu*** (`xu3369@gmail.com`), 412 W Washington ST, Urbana, IL 61801. *Delay embeddings and topological time series analysis.* Preliminary report.

In a recent paper, J. Perea and C. Tralie introduce a method of detecting quasiperiodic behavior in video data using persistent homology. Their technique is motivated by Takens delay embedding theorem: generically, one can reconstruct a dynamical system by a uniform finite sampling of an observation function along trajectories. In our work we characterize precisely quasiperiodic functions with delay embedding yielding Tori and Klein bottles. Our methods involve studying infinitesimal behavior of observation functions along integral curves and generalize to arbitrary compact manifolds. (Received September 26, 2017)