1145-65-860   **Tyrus Berry*** (`tberry@gmu.edu`), **John Harlim** (`jharlim@psu.edu`), **Timothy Sauer** (`tsauer@gmu.edu`) and **Franz Hamilton** (`fwhamilt@ncsu.edu`). *Overcoming model and observation error in data assimilation using manifold learning.*

Data assimilation methods depend on specifying the correct model for both the underlying dynamics and the mapping to observations. However, many sources of error arise in practice, such as model misspecification, neglected phenomena, or numerical truncation effects. Such errors manifest themselves in the difference between the observations and the filter estimates and forecasts. If we can find functional relationships between the current state estimates and these errors, we can adjust the model to compensate for the errors. In this talk we explore methods of learning these functional relationships based on manifold learning. In particular, we will explore methods based on Takens delay embedding reconstruction combined with the Diffusion Maps algorithm for manifold learning and nonparametric regression. (Received September 16, 2018)