1123-76-44 **Dimitrios Giannakis*** (dimitris@cims.nyu.edu), 251 Mercer St, New York, NY 10012.
Extraction and Prediction Of Coherent Patterns In Incompressible Flows Through Space-Time Koopman Analysis.

We discuss a method for detecting and predicting the evolution of coherent spatiotemporal patterns in incompressible fluid flows. The approach is based on a representation of the Koopman operator governing the evolution of observables in a smooth basis learned from velocity field data through the diffusion maps algorithm. This representation enables the detection of coherent flow patterns through Koopman eigenfunctions and simulation of the evolution of observables and probability densities under the flow map. We present applications in Gaussian vortex flows and chaotic flows generated by Lorenz 96 systems. (Received August 09, 2016)