

1116-37-1255

Hanlun Yap and **Armin Eftekhari***, armin.eftekhari@gmail.com, and **Michael B Wakin** and **Christopher J Rozell**. *Delay-coordinate Mapping in the Presence of Noise: A Stable Takens' Theorem*.

When the states of a dynamical system are confined to an (often low-dimensional) *attractor*, the Takens' theorem asserts that states of the system can be reconstructed from noise-free time-series data (through *delay-coordinate mapping*). A rich literature exists on often heuristic ways of handling noise in time-series data. In this work, we use tools and ideas from Compressive Sensing to systematically extend the celebrated Takens' theorem to account for measurement noise. In particular, we show that under certain conditions, delay-coordinate mapping stably embeds attractors of dynamical systems. (Received September 18, 2015)