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Prediction of dynamical systems from time-delayed measurements with self-intersections

We study prediction of dynamical systems from measurements performed via a one-dimensional observable along an orbit of the system. We give new versions of the Takens time-delay embedding theorem, both in the deterministic and probabilistic setting. In the latter case (when self-intersections in the reconstructed attractor can occur) we obtain upper bounds on the decay rate of prediction errors, as conjectured by Schroer, Sauer, Ott and Yorke. This is joint work with Krzysztof Barański and Yonatan Gutman.