

1077-37-1552

**Anna L Mazzucato\*** (alm24@psu.edu). *Ensemble Dynamics and Bred Vectors.*

We present some recent developments in the theory of "bred vectors". These are obtained by an appropriate rescaling of the forward evolution of an initial perturbation under a discrete non-linear system. Bred vectors are a widely used tool to assess sensitivity to initial conditions in weather forecasting models. We explore the role of bred vectors in studying dynamical systems by introducing the new concept of "ensemble bred vector", which is based on the notion of ensemble dynamics of initial perturbations, and showcase its distinctive features with two examples: one is the 3-equation Lorenz system, the other is a model of thermohaline circulation based on the Cahn-Hilliard equation. This is joint work with Nusret Balci, Juan M. Restrepo, and George R. Sell. (Received September 20, 2011)