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Chris Danforth* (danforth@math.umd.edu), Department of Mathematics, College Park, MD 20742, and **James A. Yorke**. *Making Forecasts for Chaotic Physical Processes*.

Making a prediction for a chaotic physical process involves specifying the probability associated with each possible outcome. Ensembles of solutions are frequently used to estimate this probability distribution. For a typical chaotic physical system H and model L of that system however, no L solution remains close to H for all time. We propose an alternative. This letter shows how to “inflate” or systematically perturb the ensemble of trajectories of L so that some ensemble member remains close to H for orders of magnitude longer than unperturbed solutions of L . This is true even when the perturbations are significantly smaller than the model error. (Received September 13, 2005)