Model error, attractors, and predictability

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Ed Lorenz introduced the idea of the chaotic attractor. Whether the atmosphere has an
attractor or not is probably not a useful question to answer. Forecast models, however,
do have attractors, or attracting manifolds. In this paper we demonstrate using the
Navy Operational Global Atmospheric Prediction System (NOGAPS) that the model
attractor plays an important role in predictability. In particular, we will reveal using
shadowing techniques how "initial condition" error and model error are related to the
attractor and how these effect forecasts.