What Are the New Implications of Chaos for Unpredictability?

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Abstract

From the beginning of chaos research until today, the unpredictability of chaos has been a central theme. It is widely believed and claimed by philosophers, mathematicians and physicists alike that chaos has a new implication for unpredictability, meaning that chaotic systems are unpredictable in a way that other deterministic systems are not. Hence one might expect that the question 'What are the new implications of chaos for unpredictability?' has already been answered in a satisfactory way. However, this is not the case. I will critically evaluate the existing answers and argue that they do not fit the bill.
Then I will approach this question by showing that chaos can be defined via mixing, which has never before been explicitly argued for. Based on this insight, I will propose that the sought-after new implication of chaos for unpredictability is the following: for predicting any event all sufficiently past events are approximately probabilistically irrelevant.

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