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Nonlinear Processes in Geophysics
Discussions

Interactive comment on "The onset of chaos in nonautonomous dissipative dynamical systems: A low-order ocean–model case study" *by* Stefano Pierini et al.

Anonymous Referee #2

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In this paper, a new method that characterizes the transition from periodic to chaotic dynamics in non-autonomous dynamical systems is presented. The paper is generally well written and can be published with minor revisions. Section 3.2 is not needed in my opinion. I wander if it is correct to interpret a transient growth as a "sensitive dependence on initial conditions".

Pg 5, line 4: please use the term " time evolution" instead of "time series", as in Pierini 2016, throughout the text.

Pg 5 line 7: (X,Y) is not defined. Is it the initial condition of (Ψ1,Ψ3) as in eq. 5?

Pg 6 line 5: why σ > 1 initially? σ = 1 initially by definition (5).

Pg 7, Figure 3c. with γ=1.35 you get chaos. How is it possible that two initially close trajectories never diverge? This contradicts the statement at the beginning of pg 9.

Pg 9, line 7 and following lines. I understand that you cannot compute with enough accuracy the first Lyapunov exponent (why? I found it strange for such a low dimensional system). If so, you cannot say that "the results prove unequivocally the assumption.."

Pg 9 line 11: illustrated instead of summarized.

Pg 9 caption of figure 5 and in other parts of the text: "non chaotic".

Pg 9 line 17: 4TΔ=100

Pg 10 line 25. It is a contradictory statement. Please explain it better.

Pg 15 eq 10: I do not see the reason to introduce a new symbol for Cmax. There are already a lot of symbols to keep in mind.

Pg18, last line: <θ> $\rightarrow$ <θ>Γ

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