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Nonlinear Processes in Geophysics
Discussions
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Interactive comment on "On the nonlinear feedback loop and energy cycle of the non-dissipative Lorenz model" *by* B.-W. Shen

Anonymous Referee #2

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General Comments

This is generally a pedagogic contribution elucidating the dynamics and energetics of the cyclic behavior of the Lorenz '63 (L63) system of equations. Starting from the full 3 component system the author makes the ad hoc simplification of dropping the terms accounting for fluid viscosity and and thermal diffusivity leading to the 3D non-dissipative Lorenz model (3D-NLM). This allows the energy cycle to be analyzed using straightforward, elementary mathematical techniques. The paper is not particularly novel but does present a useful perspective on the mechanisms that drive the 'quasi-cyclic' trajectories in the full L63.

Specific Comments

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Since the L63 has been extensively studied and is such a restricted model of the physics of two-dimensional dry convection does its dynamics truly warrant yet another publication? It is hoped this question will stimulate some discussion in addition to comments from the author.

The author states that the solution to equation (18) has not appeared in the published literature. This may or not be true but is hardly noteworthy since the equation is an energy conservative system with a gradient potential.The solution could be inferred form many texts on classical dynamical systems and appears in at least one compendium of solutions to ordinary differential equations; i.e. the text by Murphy.

Interactive comment on Nonlin. Processes Geophys. Discuss., 1, 519, 2014.