

# ***Interactive comment on “Hierarchical scale dependence associated with the extension of the nonlinear feedback loop in a seven-dimensional Lorenz model” by Bo-Wen Shen***

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In this paper the author extends the 5d Lorenz model to 7d Lorenz model by adding two more high wavenumber modes to the temperature perturbation. The addition of such small-scale perturbations in temperature provides negative nonlinear feedback to stabilize solutions is emphasized. Moreover, the hierarchical scale dependence of chaotic solutions between the pure vertical terms in temperature perturbation is revealed. Both results are helpful to our understanding of the chaos phenomenon. The paper is well organized and good written and I recommend it for publication.

Small comments: 1. On page 3 Ln 43 the author explains the butterfly effect of the first kind, and mentions the butterfly effect of the second kind without explanation on Ln 45.

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At least a reference should be given here. 2. On Page 3 Ln 58 the author mentioned the data assimilation schemes have been developed to improve the initial conditions. Actually the data assimilation schemes can also be used to optimize the parameters in a dynamical system. 3. To which extent the approximation of equation (9) stands? Any references? 4. On page 16 the lines are not correctly labeled between 440 and 445.

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