

## Reviewer\_1

1. Some of the scientific contributions in the paper are similar to those presented by Qian-Hua and Tian-De (2008). I strongly suggest the author check this publication and clarify the coincidences and the new contributions

Answer:

In Qian-Hua and Tian-De's paper: The authors concern the stripe pattern in sand ripples and linear dunes by computer simulations using coupled map lattices. In the dune scale simulation, wind only moves a thin layer of sand grains on the surface, and they are scattered and dispersed when landing. For a small sand bump in wind, two processes happen simultaneously: (a) With erosion in upwind side and deposition in downwind side, the bump will move to the downwind direction; (b) As an obstacle to the slowly flowing surface grains, the bump grows via sand accumulation. The influences of other connecting neighboring lattices should also be taken into account, then, the authors developed their CML model and gained their concluding remarks.

In our paper's: it is known that, the age of dunes are generally hundreds of years or thousands of years. We only want to demonstrate the final results caused by the factors interactions and the stochastic mechanism dominating evolutionary processes. As known that the complicated systems tend to organize themselves into ordered structures, the essential mechanism is nonlinearity. So the highlights of this paper are as follows: (1) to predict some evolutionary properties of dunes and ripples; (2) to explained the solitary phenomena; (3) to show the importance of nonlinear mechanism in aeolian ripple evolution.

The basic viewpoints to develop the models are different: Qian-Hua and Tian-De's thinking is mainly basing the phenomenological theory, so the results can be validated by experimental data, and the paper's conclusions are concrete, quantitative. However, our thinking is mainly basing the phenomena of nonlinear interacting, so the results can be qualitative validated by field observation, and the paper's conclusions are mainly to demonstrate the mechanism of the evolutionary processes. Thus, the main purposes of these 2 papers are different.

2. At least, to the level of order of magnitude the numerical results should be compared with some experimental or field results

Answer:

The emphasis of this paper is to qualitatively illustrate the evolutionary mechanism of desert geomorphology, we want to elucidate theoretically that, it is the nonlinear mechanism to dominate the evolutionary process of desert geomorphology, such as the sand ripple and dune, and even the aquatic sand ripple and dune caused by water currents on fluvial beds. In order to let the results apply to relatively general cases, we do not attempt to compare the numerical results with a detail survey of some important field entities. However, the readers can easily find that the results are in correspondence with the field pictures photoed by people via internet, such as the Sahara Desert; the Arabian Desert; the Namib Desert; the Australian Desert and other deserts, whose geomorphology picture can easily be gotten by the internet.

3. Although English is not my mother tongue, I found several inconsistencies in the use of English. I strongly suggest a revision of the English by a native speaker.

Answer:

The authors have accepted the advice.

## Reviewer\_2

In general, this article is more a discussion or review work associated with the sediment transport rather than new research paper reports original results. The authors have attempted to use the coupled map lattice model to describe some certain properties of modeling the evolution of sand forms and in general, this paper shows a promising application in numerical methodology. However, the reviewer thinks current manuscript is not a reasonable work for publication. For possible revision the reviewer presents some substantial concerns that should be address before publication. First, this manuscript is not well-written in English. Grammatical mistakes can be found. Furthering editing is definitely necessary. For example, the reviewer would suggest reducing long clauses to shorter phrases or sentences. Doing so will make this manuscript more readable. Besides the text, the math is another more serious concern. The notations are not consistent from the beginning to the end. This is not only an

issue of readability but theoretical soundness. Many statements should not and indeed cannot be found in a scientific paper:

Answer:

The authors have revised the manuscript according to the review's advice.

Detailed comments:

1. Page 2. Authors write: "However, the study results can be generated to cohesive and non-uniform sediments without essentially difficulty". If it is so easy, why reviewer cannot find any discussion on this subject in this work or in any references contained in this work.

Answer:

The authors have rewritten this part.

We will study this and the following questions raised by reviewer in future paper.

2. Page 3. Authors write: "The model developed in this paper can be easily extended to multi-dimensions". Again, the reviewer cannot find the discussion in this paper.

Answer:

The authors have rewritten this part.

3. Page 3. Authors write: "For definiteness, the readers may find it helpful..." Authors should avoid using jargon.

Answer:

The authors have rewritten this part.

4. Page 3. Authors write: "We are not attempt to provide a complete analysis of their prediction". The discussion is needed.

Answer:

The authors have added the discussion.

5. Page 4 and page 5. The information presented in this part has added nothing to this work. It seems that the authors want to show off their knowledge. Another problem is that the title and the abstract do not correspond to main part of the article.

Answer:

After discussion, considering the readers may be from international audience, we

think it is better for readable reason to keep as they are, however, we make it more concise.

6. Page 8. Expand any acronyms. Authors should remember that readers may be from international audience.

Answer:

The authors have rewritten them.

7. Page 16. First Para. The reviewer suggests expanding this section by in-depth examination of the result to provide more useful information regarding to the Yellow River. This Para should be supported by rational discussion.

Answer:

The authors have rewritten them.

The reviewer also has concern regarding to technical problems like parameter selection. Most of the parameters have been chosen arbitrary and the reviewer understands that it has been necessary to show some different patterns of modelling. However, the author has to discuss the reason why they did it.

Answer:

The authors have rewritten them.

#### Detailed comments:

1. Page 2. Authors write: “Without loss of generality, sediments are supposed to be non-cohesive and uniformed with particle size within 0.003-0.0001m here”. The range of particle size suggests that the authors consider very fine sand, silt or even clay in which, to the best of the reviewer knowledge, the cohesive forces may exist. Moreover, the reviewer has never seen that the saltation process strongly discussed by the authors in the manuscript occurs for such of particle sizes.

Answer:

The authors have rewritten them.

2. Page 2. Eq. (1.1). What does  $p_n(i)$  means?

Answer:

The authors have added its meaning.

3. Page 7. Authors write: “The aeolian ripples, (...) and aquatic bed-load”. May the reviewer know what kind of differences they are?

Answer:

The authors have rewritten them.

4. Pages 11, 12, 13. What is the logical relationship between values of parameters betas and epsilons? The reviewer does not understand the parameters selections.

Answer:

The authors have rewritten them.

### References:

1. Page 4. Authors have omitted without any discussion very important works by McEwan et al. associated with the sediment movement cause due to the wind. For example: “On the effect of mid-air collisions on Aeolian saltation” or “On wind velocity profile measurements taken in wind tunnels with saltating grains” from Sedimentology (citing only a few).

2. Page 15. Authors write:“(…) of fractal theory to the landform study” and in other place cited paper by Nikora et al. (1997) but have omitted a number of works by Nikora associated with the fractal structure of bed-forms from the Water Resources Research published in the mid-nineties.

3. Many other mistakes appear in the Reference part which should be re-read and re-written carefully. For example: in Stoesser et al. RODI as the fourth author is omitted.

Answer:

The authors have rewritten the references.

In summary, the reviewer does not recommend acceptance of this paper. For possible revision, the reviewer would like to suggest author to adjust the structure of this paper. This paper could more concisely introduce potential application of the models. This

work also needs to demonstrate the completeness and correctness of the parameters. Moreover, the discussion of the result is too limited in this manuscript. The reviewer suggests expanding this section by in-depth examination of the result to provide more useful information of forms evolution. Authors should also pay attention to the references and cited both most recent contribution and the old classic. What is more, abstract and title should be associated with the rest part of the paper.

**Answer:**

The authors have rewritten many parts of the manuscript.