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December 8, 2021

Dear Editor,

We would like to appeal the decision to our paper and to re-submit our work “Temporal Evolution of Erosion in Pore-Networks: From Homogenization to Instability” for reconsideration as an article in Physical Review Letters. We would like to thank the reviewers for their insightful comments and positive feedbacks, where they found our work “well written”, “interesting paper worth publishing”, with “a clear theory to explain the results”, and “excellent figures that clearly demonstrate the phenomena being Explored”. The main concern raised by the reviewers was the generality of our model and its physical relevance. We have now fully addressed this issue by expanding our initial model to a very general erosion law and identifying the homogenization condition for general erosion dynamics. We have further expanded the simplified model analysis, tested our analytical predictions by running numerical tests, and showed the agreement between our analysis and the network behavior. We therefore believe the reviewers' main concerns have been addressed. We would also like to point out that since we have posted our manuscript on the arXiv, we have received positive feedback from the community, e.g., Prof. Karen Alim, an expert in the field, has reached out to us and mentioned that she is now teaching our manuscript in a course at the Technical University of Munich.

The main changes to our manuscript include:

- Generalization of the results for an arbitrary erosion law.
- Identifying the transition condition between homogenization and channelization for a general erosion law.
- Showing the prediction power of our local dynamics model for a nonlinear erosion model.
- Showing robustness of the phase transition to boundary condition changes and thresholding effects.

We thank you for your consideration and look forward to hearing from you.

Sincerely,

Ariel Amir