

***Interactive comment on “The evolution of snow bedforms in the Colorado Front Range and the processes that shape them” by Kelly Kochanski et al.***

**Kelly Kochanski**

kelly.kochanski@gmail.com

Received and published: 14 March 2019

Dear Reviewer 1,

Thank you for your comments.

I am working on incorporating your suggestions into our final manuscript, but would like to address the most technical issues early to allow for additional feedback.

The first draft of this manuscript, I assumed that changing the flow speed would change the lengths of the recirculation zones around dunes and snow-steps. Your comments on sections 4.2 and 4.3 of this draft questioned this assumption. To address your

C1

question, I worked with colleague Aaron Hurst to address this question with a series of short numerical experiments in which we resolved the flow around roughly-shaped dunes and snow-steps using ComSOL, a fluid dynamics solver. As you suggested, we found that the length of the recirculation zone around the snow-step and the snow dune did not change significantly over the range of wind speeds experienced at our field site.

I have adjusted Figures 14 and 15 to reflect this change; the new versions are attached below for your review. Before the final version of the paper I will adjust the text explain wind-speed-dependent bedform behaviors in terms of armoring, saltation hop lengths, and grain energy rather than flow structure.

Please let us know if you have any further comments, or see any non-physical behavior in the updated figures.

Yours, Kelly Kochanski

---

Interactive comment on The Cryosphere Discuss., <https://doi.org/10.5194/tc-2018-293>, 2019.

C2

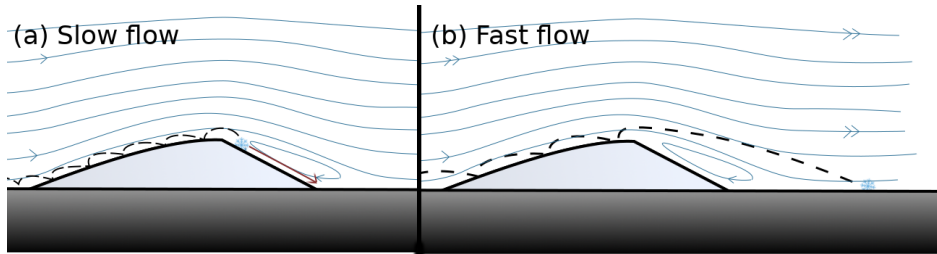


Fig. 1.

C3

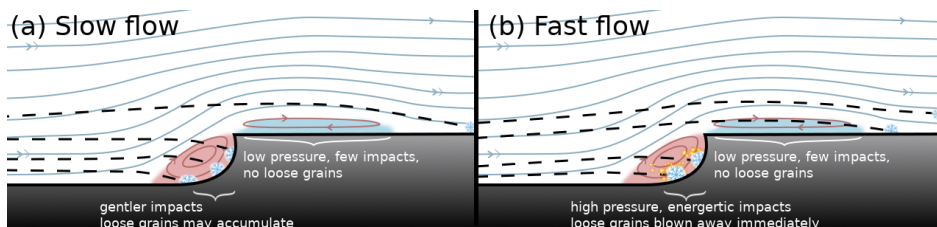


Fig. 2.

C4