

Interactive comment on “Armor breakup and reformation in a degradational laboratory experiment: detailed measurements of spatial and temporal changes of the bed surface texture” by C. Orru et al.

Anonymous Referee #3

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General Comments

This paper describes a laboratory experiment where armor was built on an initial condition, then broken up and reformed. The paper describes an interesting experiment, but felt incomplete in that the methods are included elsewhere in a submitted paper (not accessible as far as I know), the discussion and conclusion were very brief and does not quite relate the results to an implication in the real world, which I would hope for. The paper would benefit in clarity with some reorganization - it took me multiple reads to understand certain sections. Some sections I still do not understand. I offer some

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suggestions for making the paper easier to understand. I recommend a major revision and addition of more detail and information before publication of this paper.

Specific comments

Abstract I would like to see mentioned in the abstract something about the initial bed condition. It is spatially varying and that is important information.

I don't know exactly what is meant by "closer to normal flow conditions"

Section 2 experimental setup It would make much more sense to me to move paragraph 2, beginning "An initial experiment" to the end of the section after describing the sediment mixture and initial bed.

It would be useful to mention in the text that experiment T1 goes from -16 to 0 hours and T2 goes from 0 to 4.

In Figure 1 it is not clear where "downstream" is in "downstream water surface elevation." Do you mean "sand reach"?

Section 2.2 measurements

I'm having a hard time saying it is okay to review and accept this paper before seeing and evaluating (Orru, submitted 2015) is available to view and evaluate. I know this is a difficult situation if that review is taking longer than expected, but I cannot evaluate the methodology that is the basis for all of the results. The description here should be more complete, instead of assuming one can read Orru, submitted 2015.

Section 2.3 Because the bed is spatially varying, it is important to say where things happened. Where did the armor form? Say it in the text, and label the armor section in Figure 5, even if you think it is obvious.

Last sentence of 2.3 "Armor was considered fully developed after 16 h" (note that this is "0 hr" in this paper's figures, etc.)

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The described bed step is curious to me. Does this have any relevance to nature or "mess up" any of the interpretation of the lab results.

Section 3 "increasing the water discharge" - please state increased from what to what, even though it is in the figure, it is good to put it in the text. ("increase by 25%" or something like that) Give the reader an idea of how much it was increased.

Section 3.1's first paragraph very hard to follow. "Yet the fining was even stronger than we measured" - Why? Suggest rephrasing this paragraph and asking around if it makes sense to colleagues.

Figure 8 - the points vary in streamwise coordinate in the figure (there is spread in the x-axis)- are they supposed to represent one point in the streamwise coordinate? I was a bit confused by this.

Section 3.2 It is not clear to me how does figure 10 show lateral variation in degradation?

Not much is reported about the sediment transport captured in the sediment trap?

Section 4 discussion

Some of these sentences could be rearranged for better understanding.

I don't know what is the field case in "in the field case"?

In general the discussion seems short and confusing, and could be improved by providing implications for natural streams. Yes, comparisons to other studies were given, but not really related back to nature. By adding more content and having a better narrative, the discussion could be really improved.

The conclusions section is similarly hard to follow. There should make some mention of the initial bed condition and what was "base flow". Is there an implication to the last sentence?

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Interactive comment on Earth Surf. Dynam. Discuss., doi:10.5194/esurf-2016-1, 2016.

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