

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.

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We thank the reviewer for his/her review. We fully agree with the reviewer in that it would have been better to conduct a larger series of experiments to assess the effect of the imposed flow and sediment conditions on the outcome of the laboratory experiment. There is an endless range of flow and sediment conditions under which the presented laboratory experiment could (and can) be repeated. In this study we had the opportunity to do one experiment, yet with a level of detail of the measurements that has not been shown before: we show with large detail the spatial and temporal changes

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of the bed surface texture for a case of armor formation, breakup, and reformation. In particular, the novelties of our study are (a) a detailed data set on changes of the bed surface texture for a case of armor formation, breakup, and reformation under controlled conditions, (b) insights on the time scale of armor formation, (c) insights on the temporary increase of the sediment transport rate under conditions of armor breakup, (d) insights on the fact that a new armor formed quite rapidly rather than the formation of a local deep erosion pit, and (e) insights on the fact that the new armor was coarser than the initial one. Naturally the result of the laboratory experiment will be different under different flow conditions (e.g., Hassan et al., 2006, Guney et al., 2013) and different sediment conditions (e.g., Marion and Fraccarollo, 1997, Curran and Waters, 2014). Yet because of the above novelties the authors are convinced that the current results are worth sharing with the wider research community. Besides we expect that the current results will be helpful to researchers in setting up a more extensive series of laboratory experiments on armor studies (such as the series of experiments proposed by the referee), in illustrating how the image analysis technique is useful under such circumstances, and in avoiding practical issues associated with such experiments.

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