

## ***Interactive comment on “Debris flow sediment control using multiple herringbone water-sediment separation structures” by Xiangping Xie et al.***

**Xiangping Xie et al.**

xxp\_imde@163.com

Received and published: 20 March 2017

Firstly, we appreciate for the useful comments of referee 2#. Secondly, we would like to give some explanations about the problems that involved in the comments. We didn't do dimensional analysis in this paper, which does not mean the parameters we adopted (characteristics grain size and the opening widths of the structure) have no basis. According to Wantanbe(1980) , Ikeya, et al(1980) , Ashida,et al(1980) , Mizuyama, et al(1988) , relative opening width , that is, the ratio of opening width to characteristics grain size ( $d_{max}$ ,  $d_{95}$ ), of the open type dam, has decisive effect on open type dam effectiveness in debris flow prevention and considered to be the only factor in designing the spacing of open type dam(Lien,2001). As a kind of open type dam, the effectiveness of herringbone water-sediment separation structure in debris flow defense should be related to opening width and characteristics grain size. Of

course we should make a explanation in the revision. It is true that the interaction of solid- liquid current and a structure has much to do with many factors including flow velocity, flow depth, flow volume and sediment concentration, but it is difficult to study all the factors simultaneously in one experiment. Single factor experiment is a common method that used in such studies to give an explicit relationship of the objective input factors to the outputs. This paper aimed at to find out the relationship between the input factors of grain size distribution and the opening widths to the control effect of the proposed structure. So other factors mentioned above were set to be constant. While, further studies should be considered to investigate the effect of other factors in debris flow mitigation by herringbone water -sediment separation structure. Scaling issues is always a problem in debris flow-related studies. We considered the geometric scaling in flume setting and dynamic scaling in flow velocity controlling. It is our cursoriness to miss this part in the paper and will give a detailed description and discussion in the revision.

Watanbe, M., 1980. Mizuyama, T, and Uehara, S. Review of debris flow countermeasure facilities. J. of the Japan Erosion Control Engineering Society, (115):40-45 (in Japanese). Ikeya H, Uehara S. 1980. Experimental study about the sediment control of slit dams Journal of the Japan Erosion Control Engineering Society. 114:37-44. Ashida,K and Takahashi, T. 1980. Study on debris flow control-hydraulic function of grid type open dam, Annuals. Disaster Prevention Res. Inst, Kyoto Universty. 23B-2:1-9. Mizuyama T, Suzuki H, Oikawa Y, et al. 1988. Experimental study on permeable sabo dam. Journal of the Japan Erosion Control Engineering Society, 41(2):21-25. Lien H P. 2003.Design of slit dams for controlling stony debris flows [J]. International Journal of Sediment Research, 18(1):74-87.

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Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., doi:10.5194/nhess-2016-340, 2016.

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