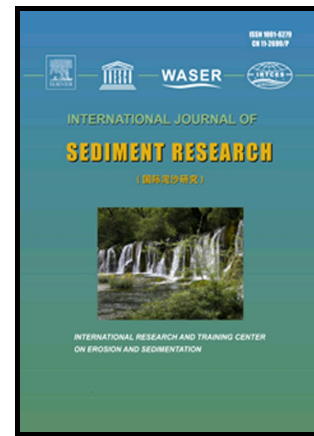


Author's Accepted Manuscript

Sheet flow hydrodynamics over a non-uniform sand bed channel

Anurag Sharma, Bimlesh Kumar



www.elsevier.com/locate/ijsrc

PII: S1001-6279(18)30029-5
DOI: <https://doi.org/10.1016/j.ijsrc.2018.01.004>
Reference: IJSRC161

To appear in: *International Journal of Sediment Research*

Received date: 3 October 2016
Revised date: 14 December 2017
Accepted date: 31 January 2018

Cite this article as: Anurag Sharma and Bimlesh Kumar, Sheet flow hydrodynamics over a non-uniform sand bed channel, *International Journal of Sediment Research*, <https://doi.org/10.1016/j.ijsrc.2018.01.004>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting galley proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Sheet flow hydrodynamics over a non-uniform sand bed channel

Anurag Sharma¹, Bimlesh Kumar*

Department of Civil Engineering, Indian Institute of Technology Guwahati, Guwahati-78109, India.

anurag.sharma@iitg.ac.in

bimk@iitg.ernet.in

bimk@iitg.ac.in

*Corresponding Author: Associate Professor, Department of Civil Engineering, Indian Institute of Technology Guwahati, India-781039, 0091-361-2582420

Abstract

The current study experimentally investigates the flow characteristics and temporal variations in the sheet flow profile of a non-uniform sand bed channel. Experiments were done to explore turbulent structures in the presence of a sheet flow layer with and without seepage. The turbulent events, such as stream wise velocity, Reynolds shear stresses, and turbulence intensities were found to be increasing and vertical velocity was found decreasing with a sheet layer. The presence of a sheet layer also effects the turbulent energy production and energy dissipation. All the turbulence parameters with and without a sheet layer have also been influenced by the presence of downward seepage. The rate of sheet flow movement is increased with seepage, owing to increased turbulence with seepage. The current study used wavelet analysis on temporally lagged spatial bed elevation profiles obtained from a set of laboratory experiments and synchronized the wavelet coefficients with bed elevation fluctuation at different spatial scales. A spatial cross correlation analysis at multiple scales, based on the wavelet coefficients, has been done on these bed elevation datasets to observe the effect of downward seepage on the dynamic behavior of sheet flow at different length scales. It is found that seepage

¹ Research Scholar, Department of Civil Engineering, Indian Institute of Technology Guwahati, India-781039

Download English Version:

<https://daneshyari.com/en/article/8959591>

Download Persian Version:

<https://daneshyari.com/article/8959591>

[Daneshyari.com](https://daneshyari.com)