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Flow Characteristics over a Gravel Bedform: Kaj River Case Study

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A b s t r a c t

The present study deals with the turbulence structure in order to better understand the interaction of bedform and flow characteristics in a gravel-bed river. Data measured above a bedform is used to analyze the importance of coherent structures in turbulent transfer. The Reynolds stress and turbulence intensity in stream-wise direction illustrate significant difference along the bedform, showing a three-layer distribution at the crest and a convex one at the downstream of bedform. Quadrant analysis technique is used to picture momentum exchange above the considered bedform and to find the dominant event in bursting process of the gravel bedform. Quadrant analysis demonstrates that the mechanisms of bedforms generation in sand and gravel-bed rivers are similar and sweep is the dominant event in both rivers.

Key words: turbulence, bedform, gravel-bed river, quadrant analysis, Reynolds stress.