# Accepted Manuscript

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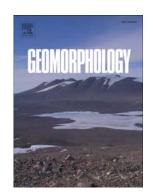
PII: S0169-555X(16)30824-8

DOI: doi: 10.1016/j.geomorph.2016.09.008

Reference: GEOMOR 5755

To appear in: Geomorphology

Received date: 7 January 2016 Revised date: 29 August 2016 Accepted date: 6 September 2016



Please cite this article as: Mao, L., Dell'Agnese, A., Comiti, F., Sediment motion and velocity in a glacier-fed stream, Geomorphology (2016), doi: 10.1016/j.geomorph.2016.09.008

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## ACCEPTED MANUSCRIPT

## Sediment motion and velocity in a glacier-fed stream

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#### **Abstract**

Current understanding of coarse sediment transport (e.g. threshold for motion, travel length and virtual velocity) in mountain rivers is still quite limited, and even less is known about glacial streams. However, the hydrological characteristics of these systems (strong daily discharge fluctuations, high water turbidity) pose challenges to the use of tracers to monitor bed sediment dynamics, as tagged clasts are usually located after bedload events when flow stage has receded, e.g. by means of portable antennas in the case of Passive Integrated Transponders (PIT). The use of stationary antennas, still scarcely in use worldwide, to detect PIT-tagged particles has potential advantages in glacier-fed streams. If water discharge is monitored continuously, a stationary antenna provide real time data on the actual discharge at the moment of tracers particles passage. This study focuses on incipient motion and virtual velocity of bed particles measured by a stationary antennas system in a steep mountain channel (Saldur River, drainage area 18.6 km², Italian Alps) where significant daily discharge fluctuations and bedload transport occur as a result of a nivo-glacial regime. Four stationary antennas were installed 50-m apart in the study reach. A

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