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Bedload transport in two Alpine mountain streams with glacial meltwater runoff

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The Fischbach and the Ruetz are two mountain streams in Western Austria which are fed by glacial meltwater, and feature regular bedload transport during the summer months. Since spring 2008, indirect bedload transport measurements are carried out in these streams with geophones installed in the so-called Swiss plate geophone system. The sites are operated by the Tyrolean water power company (TIWAG) and also discharge data are available. The geophone sensors record the motion of bedload particles transported over a steel plate mounted flush with the channel bed. As for other streams equipped with the Swiss plate geophone system, calibration measurements performed by TIWAG show an approximately linear relation between number of impulses (the number of peaks above a pre-defined threshold value) and bedload mass transported over the sensors. For the period 2008 to 2011, bedload transport efficiency was assessed by comparing the geophone data with discharge data and with bedload transport equations. The bedload transport efficiency varied systematically over the observation period of four summers of almost continuous bedload transport activity. We present and discuss the variation of bedload transport efficiency in the two streams.