



Start and end of bedload transport in gravel-bed streams

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The threshold of incipient bedload motion, expressed either as a critical force or as a critical water discharge, is a key parameter in bedload transport prediction. Measuring the threshold of motion is difficult, and reliable data from natural streams are rare. By recording the vibrations triggered by bedload particles when moving over a steel plate mounted in the channel bed, we determined the time at start and end of bedload transport in four streams, where discharge is continuously monitored. The threshold discharge scatters over approximately one order of magnitude for each stream, reinforcing previous observations that critical discharge is characterized by a distribution of values. A strong correlation between the discharge at the start of transport and the discharge at the end of transport of the previous event suggests that the local grain environment, affecting for example friction angles and local protrusion, plays an important role in determining the threshold of motion.