Earth Surface
Dynamics
Discussions
Open Access
EGU

Interactive comment on "Bedload transport measurements with Swiss impact plate geophones in two Austrian mountain streams (Fischbach and Ruetz): system calibration, grain size estimation, and environmental signal pick-up" *by* Dieter Rickenmann and Bruno Fritschi

Anonymous Referee #2

Received and published: 28 May 2017

The authors present reports on calibration measurements of the Swiss plate geophone (SPG) system in two mountain streams, the Fischbach and Ruetz gravel-bed in Austria. A total of 52 measurements were recorded. These streams are characterized by important runoff and bedload transport during the snowmelt season. The paper covers: different ways of analyzing the geophone calibration measurements, how the observed coarsening of the grain size distribution with increasing bedload flux can be qualitatively reproduced from the geophone signal, and the geophone impulse noises. Lots

of statistical analyses are presented to correlate between the bed load mass and geophone impulse. Such a detailed and technical analysis can be important in hydraulic applications, including, particle-laden stream flows and power plants. This is a largely technical paper; well written, well organized and discussed. The audience of Earth Surf. Dynam. may benefit from its publication. However, it is not clear if the method is also applicable for more dense flows as a mixture of viscous fluid and particles including the debris flows, debris floods and other types of particle transports. It would be relevant to discuss these and similar aspects.

Title: Do you need to mention about SPG and stream names in the title? Could be made more elegant?

Detailed comments/suggestions:

L72: what is the slope in flow direction?

L118: IMP –> IMP (Impulse)

L161: a slightly poorer performance: elaborate.

L175-176: Notation: IMPT sounds a bit strange. Is T here for 'Transport rate'? Then, change to IMPR? Also why not to avoid 0.5^{-1}?

L231-232: traffic noise appears to be a likely source of the geophone impulses: Couldn't that be checked by running some vehicles over there?

L265-266: it is known that the signal response depends on factors such as grain size, fluid or particle velocity, particle shape and mode of transport: So, the system could also be potentially used for debris flows/floods as in Mergili et al. (2017, GMD), von Boetticher et al. (2016, GMD), Pudasaini (2012, JGR), etc. May be discuss on this.

Table 1: Why do you use different 'Sampling duration of calibration measurements'?

Table 3: (a1, b1) and (a2, b2) are the same for both sites. What does it mean?

Fig. 6: The dashed lines are meant to guide the eye.: Not clear how?

Fig. 14: Lines in Fig.: are these regression lines?

C3