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Earth Surface Dynamics Discussions

Interactive comment on "Seismic detection and tracking of avalanches and slush flows on Mt. Fuji, Japan" *by* Cristina Pérez-Guillén et al.

Anonymous Referee #2

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The paper by Pérez-Guillén et al. investigates the seismic signals generated by snow avalanches on Mt. Fuji, Japan. Seismic data are recorded by a permanent seismic network designed for volcano monitoring. Seven events are analyzed using the Amplitude Source Location (ASL) method. Aerial photos, field observations and numerical simulations are used to constrain the accuracy of the ASL. I agree on the comments and on the evaluation made by Referee #1. The paper is well written, the ASL methods is for the first time applied to show avalanches and results show that ASL can be successfully used to track large snow avalanches. I recommend publication after minor revisions, here following my main comments.

Title: I would skip the word "detection" to avoid confusion. Authors are tracking few events manually identified; they are not analyzing a continuous stream of data.

Seismic dataset: Actually, most analysis are performed only on avalanche #1, avalanche #5, avalanche #6 and avalanche #7. I guess this is due to the availability of complementary information used for the validation of results. Please consider to clarify this point. Also, "(not verified)" and "?" in Table 1 can be misleading without an explication in both text and caption.

Figure 1: Could you add graphic elements to highlight settlements and communication routes in the Mt Fuji map? This would give some information on vulnerability to the reader.

Figure 7: I would suggest enlarging the map and maybe using different colors/markers for some events (e.g., grey markers of avalanche #6 blend with the background).

Discussion: I would deepen the discussion on seismic energy release and ASL comparing your results with those presented in other studies investigating seismic signals induced by other processes (i.e., rockfalls, debris flows, and lahars). Walsh et al. (2016) compared the seismic tremor amplitudes from a lahar to amplitudes generated from active seismic sources distributed along the drainage network to obtain estimates of lahar tremor location with ASL and energy release. In studies investigating seismic signals generated by rockfalls (e.g., Deparis et al., 2008; Levy et al., 2015), a scaling relationship between the duration of the process and its seismic energy and potential energy loss was shown. Coviello et al. (2019) proposed a scaling relation between kinetic energy and seismic amplitude indicating that for debris flows a little portion of the kinetic energy of each surge is converted into seismic energy.

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