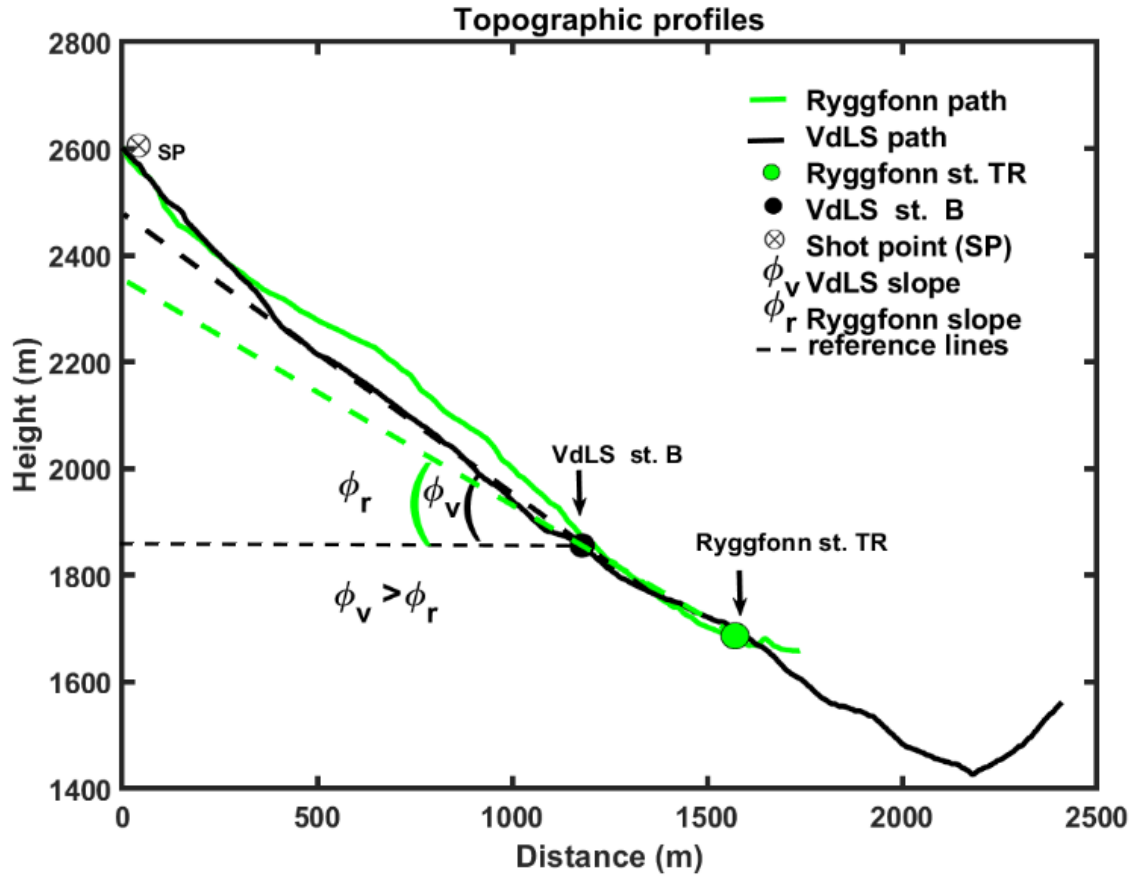**Figure S1.** Example of the different appearance of the seismogram (Z component) (top) and the spectrogram (bottom) of the signals from an earthquake (1) of December 6, 2010, (ML 3.1; 6:41:24 UTC) with hypocenter in France (46.05° N; 6.94° E; depth 3 km; Swiss Seismological Service (SED)) located about 43 km from VDLS and the avalanche (2) possibly triggered by it [52].

Figure S2. Topographic profiles of the path of the VdLS and Ryggfonn sites. The distance from SP to sensor VdLS B is approximately 1200 m, and the distance from SP to Ryggfonn sensor TR is approx. 1500 m. The path slopes near the sensors are ϕ_v =31.5° and ϕ_r = 26.4° for the VdLS and Ryggfonn sites, respectively.
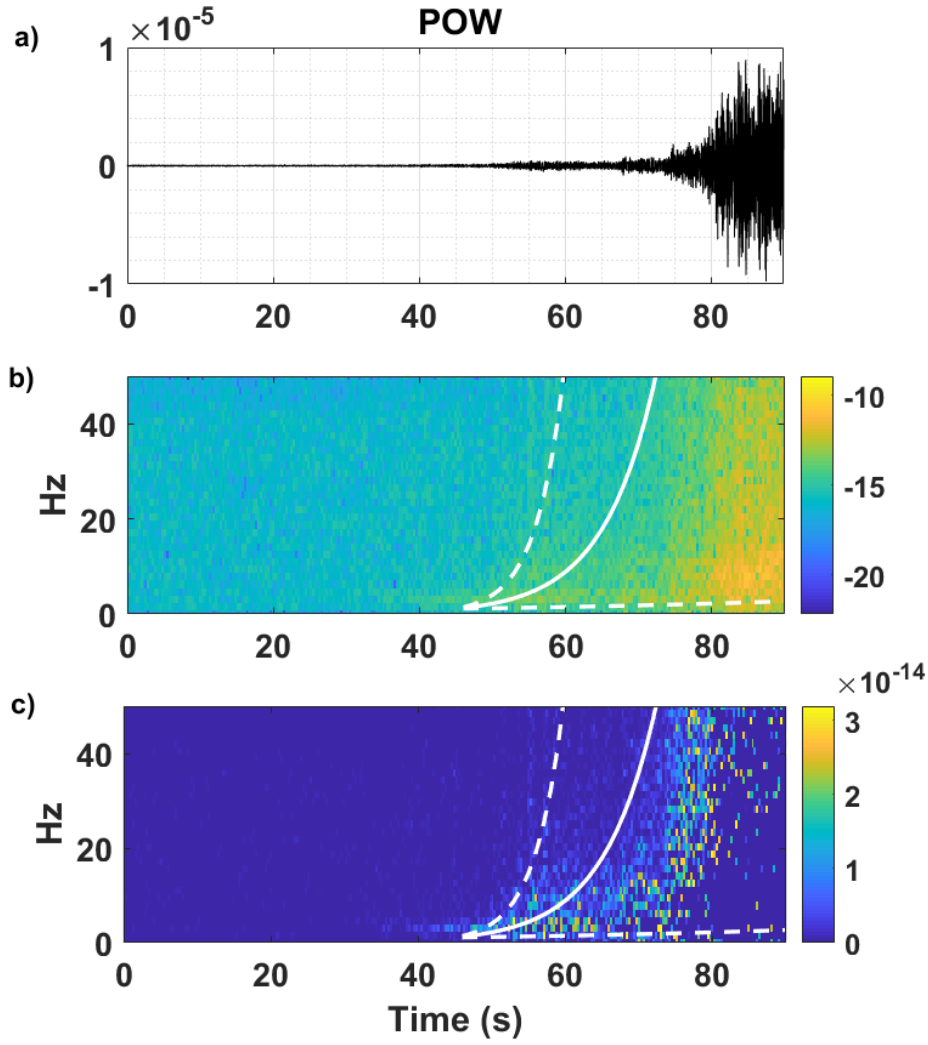
Figure S3. a) FS seismogram, b) spectrogram, and c) bounded array image of the spectrogram of a POW snow avalanche recorded at B at the experimental site VdLS (SLF, Switzerland). Horizontal axis is time. Log10 spectrogram amplitude color scale in $(m\ s^{-1})^2$ s. Color scale of the bounded array image of amplitude in $(m\ s^{-1})^2$ s (See [24] for explanation). Superimposed are the exponential curves (solid white line) (Eq. (7)) obtained with the corresponding K and β values and error margins (dashed white lines) (Table 2).
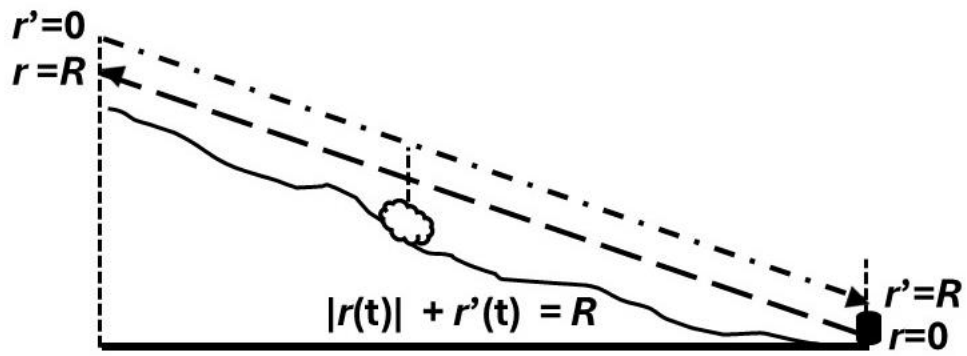
Figure S4. Scheme of the double distance coordinates system. Origin situated at the sensor ($r = 0$), and origin at the source $r'=0$, being r(t) the distance of the source to the sensor at time t and $R= |r(t)| + |r'(t)|$.
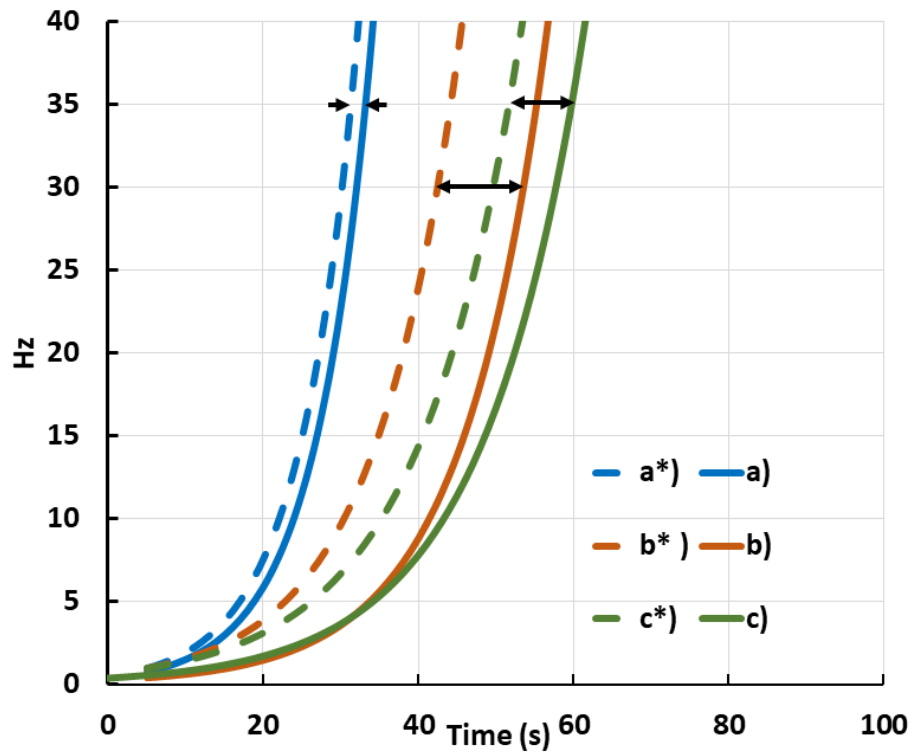
Figure S5. The role of parameter K (Hz). Solid lines: curves created using the K and β values (Eq. (7)) for the snow avalanches at Ryggfonn. The following values are indicated as (K, β). a) 2005106 d/d (1, 0.23), b) 2007081 d/d (0.78, 0.14), c) 2004059 d/m (0.37, 091), d) 2008113 d/m (0.04, 0.08) (Table 3). Dashed line curves (indicated by *) using the same β value and K = 1 Hz. Horizontal black arrows indicate the shift between the two corresponding curves. Notice that the shape is the same.