

17-011 - Rockrisk (2014-2016) field tests: Accelerometer recordings

Abstract

Accelerometer recordings of two single-block experimental rockfalls carried out in two quarries in northeastern Spain are provided.

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2 Purpose of experiments

The main purpose of the experiment was to study rock fragmentation of rockfalls on slopes. For this, two experiments in which rock blocks were released down a slope were performed. The testing sites were located in two quarries in northeastern Spain (Foj limestone quarry, Vallirana, and Ponderosa andesite quarry, Riudecols). Slope profiles consisted of an inclined slope (50-70 °) and an horizontal platform at the end of the slope where blocks stopped their motion. In addition to the accelerometer, blocks were tracked using high-speed video-cameras, from which trajectories and impact velocities could be determined. The accelerometer recordings in this dataset correspond to impact and propagation of the released blocks, from which we find seismic energies and seismic signal features associated to block breakage.

3 Instrumentation and dataset

Seismic signals were obtained by means of a Titan Triaxial Accelerometer (sampling frequency = 250 Hz, 1/8 g saturation limits) located on the horizontal platform at some 20-30 m from the impacts. For each block release, two sets of three-component recordings were uploaded: The whole signal, and the waveform of the main impact onto the ground at the end of the slope. Recordings are provided for 21 blocks at Foj and 28 at Ponderosa. Recordings are given in counts as amplitude units. They can be converted to g units as:

$$A[g] = A_{counts} * (1/8)/(64E + 6) = A_{counts}/5.12E + 8$$

4 Further information

Website of the Rockrisk project: <https://rockmodels.upc.edu/en/rockrisk-project>