



Measurement of the dynamics of changes in impact forces of water drop on a rigid ground

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Water erosion is one of the phenomena that destroy the soil surface. Irrespective of its scale, it always starts with a fall of a single drop onto the soil surface. The greater the impact, the more intense the soil erosion is.

The impact of a drop hitting the soil surface has hitherto been calculated from the kinetic energy. The value of this energy, in turn, was either converted from the value of potential energy (given the height of the fall and water drop weight) or calculated based on the weight and velocity of the drop immediately before the fall (using high-speed measurement cameras).

The aim of the present study was to measure directly the water drop impact. To this end, a dynamic pressure sensor based on piezoceramic transducers installed in a dedicated enclosure that ensured water resistance and tightness of the electronic parts of the device. Due to the sampling frequency and versatility of use a NI USB-6363 National Instruments card was used for signal acquisition.

The devised sensor facilitated recording changes in the impact of the water drop on the substrate. This helped record the distribution of the impact of analysis thereof. The paper presents several examples of distributions recorded in different conditions.

The calibrated sensor is an efficient tool to be used in further investigations of the splash phenomenon.