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Laser diffraction as an alternative method of measuring aggregate stability

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The stability of the soil aggregates plays an important role in the water-air balance in the soil. One of the important characteristics of the soil aggregates, in besides their size, is their waterproofness. The most commonly used methods for measuring the stability of soil aggregates are those based on wet sieving, rainfall simulation, ultrasonic vibrations and clay dispersion.
In our proposed method we use the naturally occurring phenomenon of decomposition of soil aggregates in water, which occurs during the measurement of particle size distribution of soil particles by laser diffraction in case of lack of appropriate sample dispersion before measurement. Knowing the diameter of the soil aggregates it is possible to determine their water resistance. We have found that there is a relationship between water resistance of soil aggregates and the organic matter content.
On the basis of measurements it was found that the laser diffraction method can be used to assess the stability of soil aggregates. It is also worth noting the wide range of application of the proposed method for measuring the stability of aggregates for all types of aggregates (both moderately and highly stable). This method is particularly useful for very stable soil aggregates for which the WRI from the wet sieving method is > 0.9, because it allows the observation of differences between their stability, which was practically unmeasurable with the previous method.

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