



A combined Settling Tube-Photometer for rapid measurement of effective sediment particle size

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Sediment and its movement in water is commonly described based on the size distribution of the mineral particles forming the sediment. While this approach works for coarse sand, pebbles and gravel, smaller particles often form aggregates, creating material of larger diameters than the mineral grain size distribution indicates, but lower densities than often assumed 2.65 g cm^{-3} of quartz. The measurement of the actual size and density of such aggregated sediment is difficult. For the assessment of sediment movement an effective particle size for the use in mathematical can be derived based on the settling velocity of sediment. Settling velocity of commonly measured in settling tubes which fractionate the sample in settling velocity classes by sampling material at the base in selected time intervals. This process takes up to several hours, requires a laboratory setting and carries the risk of either destruction of aggregates during transport or coagulation while sitting in rather still water. Measuring the velocity of settling particles in situ, or at least a rapidly after collection, could avoids these problems. In this study, a settling tube equipped with four photometers used to measure the darkening of a settling particle cloud is presented and the potential to improve the measurement of settling velocities are discussed.