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Investigating density measurements as a means of determining suspended sediment concentrations in aquatic environments.

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Obtaining accurate suspended sediment concentrations is labour-intensive, time-consuming and expensive. It entails sampling and laboratory analyses or continuous monitoring of certain proxies (e.g. turbidity). This study investigates if a less expansive two-step method, based on in-situ density measurements is a valid alternative.

In the first step, river water, containing sediment in suspension, is pumped into the density meter, thus determining the density of the water-sediment mixture. The second step entails centrifuging the river water, causing a separation of sediment and water, before pumping it into the density meter, thus obtaining the density of the clear river water.

To derive sediment concentrations from both density measurements, another unknown value must be determined as well, i.e. the density of the sediment. Assuming that this parameter is not subject to great variation throughout time, the density of the sedimentis determined periodically by taking samples and measuring sediment concentrations by means of filtration.

This poster focuses on the evaluation of density measurements as a means of determining sediment concentrations within the limits of uncertainty obtained by other methods.

The density meter used for this study is the Anton Paar DMA 4500, whose measuring principle is based on harmonic oscillation. An U-tube with a known volume is forced

to oscillate; the period of oscillation is directly related to the density of the content of the U-tube.

The accuracy of the instrument is 5.10^{-5} g/cm^3, but this study examines the influences of variation in concentration, grain size and density of the sediment in suspension. After determining the impact of these parameters separately, the combination and their effects on the result are researched. All of the results will be presented on the poster.