

# Investigation of instruments for real-time suspended sediment monitoring

Many rivers transport fine sediment particles in suspension (Fig. 1). This is ecologically relevant and needs to be considered in the sustainable operation of hydropower plants, e.g. with respect to reservoir sedimentation and turbine erosion. Real-time data on suspended sediment concentration (SSC) and particle size distribution (PSD) are required for a better understanding of such processes and as a basis for improved sediment management. Various measuring techniques are available: turbidimetry, acoustic attenuation and/or backscatter (ABS, Fig. 2), densimetry and Laser In-Situ Scattering and Transmissometry (LISST).

As a basis for field studies, the performances of such instruments shall be investigated in the hydraulic laboratory. Therefore, measurements on sediment-laden water at increasing SSC will be carried out using these instruments and reference methods. The measurements will be evaluated to (i) establish or improve the calibration of the instruments, (ii) describe their application ranges and (iii) contribute to the further development of combined applications of such instruments. In this project, you will get insight into many state-of-the-art methods for real-time suspended sediment monitoring while improving your skills for experimental investigations and data evaluation.

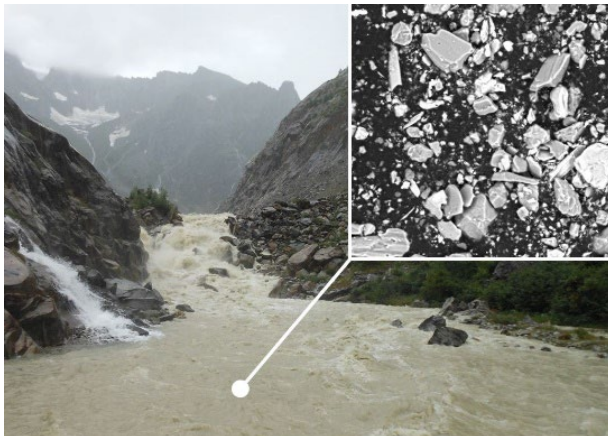


Fig. 1: Mountain stream downstream of the Fieschergletscher and microscopic image of sediment particles (Abgottspon *et al.* 2016)



Fig. 2: Acoustic sensor for measurements of suspended sediment concentration (LISST-ABS) ([www.sequoiasci.com](http://www.sequoiasci.com))

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**Particularities:**

Up to 2 students for a Project or a BachelorThesis;  
report in German or English