



Continuous measurements of suspended sediment loads using dual frequency acoustic Doppler profile signals

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A huge threat to Hydropower plants (HPP) is incoming sediments in suspension from the rivers upstream. The sediments settle in the reservoir and reduce the effective head as well as the volume and reduce consequently the lifetime of the reservoir. In addition are the fine sediments causing severe damages to turbines and infrastructure of a HPP. For estimating the amount of in-coming sediments in suspension and the consequent planning of efficient counter measures, it is essential to monitor the rivers within the catchment of the HPP for suspended sediments. This work is considerably time consuming and requires highly educated personnel and is therefore expensive. Surrogate-indirect methods using acoustic and optic devices have been developed since the last decades that may be efficiently applied for the continuous monitoring of suspended sediment loads.

The presented study proposes therefore to establish a research station at a cross section of a river which is the main tributary to a reservoir of a HPP and equip this station with surrogate as well as with common method of measuring suspended load concentrations and related flow discharge and level. The logger at the research station delivers data automatically to a server. Therefore it is ensured that also large flood events are covered. Data during flood are of high interest to the HPP planners since they carried the most part of the sediment load in a hydrological year. These peaks can hardly be measured with common measurement methods. Preliminary results of the wet season 2015/2016 are presented. The data gives insight in the applicable range, in terms of scattering particles concentration-average size and corresponding flow discharge and level, eventually enabling the study of suspended sediment load-water flow correlations during peak events.

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