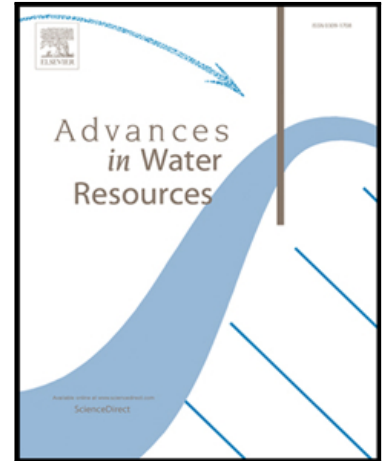


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A Combined use of Acoustic and Optical devices to investigate suspended sediment in Rivers

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Highlights

- A combined use of the LISST-SL optical sampler and a down-looking 1200 kHz ADCP profiler, gave insights in the performances of optical and acoustic methods when investigating suspended sediment in the Danube River.
- A combined deployment of those measuring techniques may aid to detect ideal conditions for LISST-SL measurement across a large river channel. For example, a moving ADCP may be used to track regions characterized with acoustic parameters values where LISST-SL could subsequently be deployed for a more accurate and quantitative assessment.
- Obtained vertical profiles of sediment concentration, mean size and acoustic parameters from repeated samples by LISST-SL and ADCP recording, respectively, pointed out density anomalies at shallow depths rather than actual concentration values of suspended sediment. These density anomalies were related to the cold water inflow from Hron River.
- The LISST-SL required two minutes measuring in fixed positions, eventually limiting the standard deviation to 10% of the expected mean value, except for low concentrations (i.e., in the range of 5-10 mg/l) of sand that resulted in the same order of the corresponding standard deviations over two minutes.
- The acoustic device appeared particularly sensitive to suspended sediment from the riverbed. A moving ADCP located regions of sediment entrainment from riverbed, fine sediment fully suspended in the water column and the extent of Hron River inflow dispersion into Danube main streamflow.

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