Geophysical Research Abstracts
Vol. 19, EGU2017-17816, 2017
EGU General Assembly 2017

Concentration Measurements of Suspended Load using ADV with Influence of the Particle Size

Kordula Schwarzwälder

Technische Universität München, Hydraulic and Water Resources Engineering, München, Germany (schwarzwaelder@tum.de)

ADV backscatter data can be used under certain conditions to gain information about the concentrations of suspended loads. This was shown in many studies before (Fugate and Friedrichs 2002; Chanson et al 2008; Ha et al. 2009). This paper reports on a pre-study to investigate the influence of particle size on concentration measurements for suspended sediment load with ADV. The study was conducted in a flume in the Oskar-von-Miller-Institute using fresh water from a river including the natural suspended load. The ADV used in the experiments was a Vectrino Profiler (Nortek). In addition water samples were taken for TSS and TOC. For the measurements a surge was generated in the flume to ensure that also particles of larger size will be present in the water phase. The measurements and samples were taken during the whole surge event. Therefore we were able to find a good correlation between the backscatter data of the ADV and the TSS as well as TOC results. For the decreasing part of the flow event the concentration of TOC in the suspended load of the water phase is decreasing much slower than the TSS and results in a damped decrease of the backscatter values. This means that the results for concentration measurements might be slightly influenced by the size of the particles. Further evaluations of measurements conducted with a LISST SL (Sequoia) will be investigated to show the trend of the particle sizes during this process and fortify this result.

David C. Fugate, Carl T. Friedrichs, Determining concentration and fall velocity of estuarine particle populations using ADV, OBS and LISST, Continental Shelf Research, Volume 22, Issues 11–13, 2002

H.K. Ha, W.-Y. Hsu, J.P.-Y. Maa, Y.Y. Shao, C.W. Holland, Using ADV backscatter strength for measuring suspended cohesive sediment concentration, Continental Shelf Research, Volume 29, Issue 10, 2009

Hubert Chanson, Maiko Takeuchi, Mark Trevethan, Using turbidity and acoustic backscatter intensity as surrogate measures of suspended sediment concentration in a small subtropical estuary, Journal of Environmental Management, Volume 88, Issue 4, 2008