Measurements of turbidity currents in a reservoir by means of a SONTEK Argonaut XR

J. Schneider, H. Badura, W. Troy, H. Knoblauch

October 7, 2006

Sedimentation is an increasingly problem in Alpine reservoirs. It leads to a reduction of storage capacities of reservoirs on one hand and might endanger the operating equipment like bottom outlets as well as power conduit inlets and gates on the other hand. The presented measurements are a part of the project *Influence of turbidity currents on reservoir sedimentation – venting through a bottom outlet as an alternative*. Besides the minimization of sediment input into a reservoir because of landuse measures in the catchment area and sediment traps upstream of reservoirs the removal of sediment out of the reservoir by means of flushing or dredging actions might lead to a sustainable sediment management of reservoirs.
Nevertheless dredging is expensive, the removed sediment has to be recycled or deposited, flushing is expensive too and might result in ecological troubles. A possibility to avoid these problems would be to vent turbidity currents through the bottom outlet during a flood for retarding the settling of sediment in the reservoir at all.
The performed measurements, which should be showcased at the conference, are the determination of the velocity distribution besides other measurements like turbidity, temperature or conductivity in two locations in the reservoir Großsölk in Austria. The velocity measurements are carried out with two downlooking SONTEK Argonaut XR. One is installed on a vertikal rope which is affixed to two wires that are clamped across the reservoir at the upstream part of the reservoir. The distance between the Argonaut and the reservoir bed is about 7 meters. The second Argonaut is fixed at a steel girder which is affixed directly at the bottom outlet. The distance there between the Argonaut and the bottom is about 8 meters. A continuous recording of velocities (resolution of 10 minutes) is operating and will also cover the scheduled opening of the bottom outlet.

DI Dr. Josef Schneider, DI Hannes Badura, Wolfgang Troy, DI Dr. Helmut Knoblauch,
Institute of Hydraulic Engineering and Water Resources Management,
Graz University of Technology,
Stremayrgasse 10, A–8010 Graz,
schneider@tugraz.at