

## Programme du workshop

10h00	Accueil et café	
10h15	Introduction sur l'idée de SEDMIX	A. Schleiss (PL-LCH, EPFL)
10h30	Aperçu des WPs et questions pratiques	A. Amini (PL-LCH, EPFL)
10h45	WP1: Conception, simulation numérique d'opération et logistique du démonstrateur	C. Münch (HES-SO, Valais)
11h00	WP2: Monitoring du bassin versant et des apports en sédiment fin (courant de turbidité)	P. Molnar (IFU, ETHZ)
11h15	WP3: Optimisation de la performance de SEDMIX en tenant compte de la dynamique des réservoirs	P. Manso (PL-LCH, EPFL)
11h30	WP4: Monitoring des turbines et transport des sédiments fins dans la galerie d'amenée	R. Boes (VAW, ETHZ)
11h45	WP5: Dynamique des sédiments fins et suivi écologique à l'aval des réservoirs	M. Doering (ZHAW)
12h00	Pause de midi	
14h00	Discussions: implications financières pour les partenaires industriels potentiels et prochaines étapes	
15h30	Clôture de la journée, verre de l'amitié	



## SEDMIX

Evacuation de sédiments fins d'un réservoir à travers la prise d'eau à l'aide d'un mixeur

20 novembre 2018, 10h00 à 15h30  
Stadttheater, Olten

## Inscription

La participation à cet atelier est gratuite. Toutefois, à des fins d'organisation, merci de vous inscrire par email à [azin.amini@epfl.ch](mailto:azin.amini@epfl.ch) jusqu'au 26 octobre 2018. Les présentations seront en français ou allemand.

## Invitation to dam operators – Purpose of the workshop

Reservoir sedimentation and consequently not only lack of storage volume but mainly perturbation of the operation of intakes and bottom outlet is a key challenge affecting both hydropower production as well as dam safety and flood management. In the framework of a peer-reviewed research project (Jenzer et al., 2011) an innovative countermeasure, called SEDMIX, was proposed allowing to keep in suspension or re-suspend the fine particles near the power water intakes, thanks to an optimized arrangement of four water jets producing an upward whirling flow like produced by a mixer. With such a system, the suspended particles can be conveyed downstream at acceptable rates through the power waterways during the normal operation of the hydropower plant. Although experimental studies have shown the very promising efficiency of such a device in simple cases and by numerical simulations in a reservoir, SEDMIX performance has not been investigated yet in a real-life reservoir under prototype conditions.

We are therefore pleased to announce that we are organizing a workshop to promote the construction and trial operation of a real-size SEDMIX demonstrator in the framework of an applied research study. The main objective is to investigate the evacuation efficiency of a prototype SEDMIX device in mitigating fine sediment deposition in storage reservoirs near the dam and its outlets. Several SCCER partners are involved in the project, each one contributing to the project with its expertise in a specific domain and answering the relevant practical questions for the prototype operation. The expected outcome is (i) to validate the sediment release efficiency as compared to laboratory development conditions and validate numerical simulations; (ii) to characterize the dependence from local conditions resulting in an optimum arrangement; (iii) to identify practical guidelines for the field implementation of SEDMIX prototype; (iv) to assess the suspended sediment concentration entering into the powerways depending on the operation intensity of SEDMIX and to define acceptable suspended sediment concentration limits in view of the river downstream of the powerhouse as well as the impact on turbine runners if any. Finally, the demonstration project aims to deliver an operational pilot SEDMIX installation, including the optimum design of the SEDMIX device, its operation control and monitoring, as well as detailed protocol for its implementation, operation and relocation, allowing for a full-scale industrial development and use.

Once the demonstrator is tested and its operation is optimized in some reservoirs, the SEDMIX device can be used principally in other reservoirs with fine particles sedimentation problems often triggered by turbidity currents.

The interdisciplinary project team is looking for dam operators as industrial partners willing to test the SEDMIX prototype under controlled and unharmed conditions in their reservoir near the power intake. The in-kind contribution of the industrial partners can be doubled at least or even tripled in the framework of an Innosuisse (former KTI) research project together with the support of SFOE, which will allow to make a comprehensive performance test of the SEDMIX demonstrator in 2019. The main and foremost contribution of dam owners will be their acceptance of implementation of the SEDMIX demonstrator and its operation in one of their reservoirs during a period of three to four months starting this summer. The SEDMIX demonstrator consists of easily transportable pieces designed to be assembled at the dam site and be installed in the reservoir with the help of a floating platform fixed by cable trucks. The water for jets will be operated and supplied by a submerged pump. The in-kind support for each industrial partner for a testing period of 3 to 4 months is expected to reach 150 kCHF comprising electricity cost for operation, manpower for assembling, installation and monitoring support as well as a limited cash contribution. The direct benefit for the dam owner arises from the controlled and safe release of significant fine sediment volumes in front of the intakes during the SEDMIX operation period. It has been carefully estimated that the suspended sediment concentration will be tripled by the SEDMIX device compared to the natural concentration in the reservoir.

The device may stay for one or two late summer periods (each time for 3 to 4 months as already mentioned) in a reservoir before being disassembled and moved to another reservoir. The applied demonstration research project is due to start in 2019 with testing periods in reservoirs from 2020 to 2023.