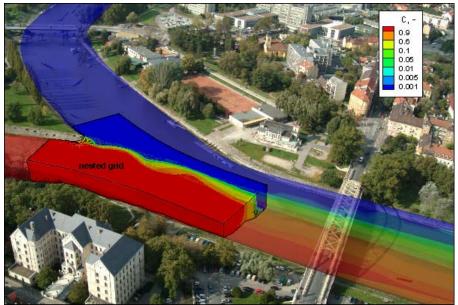# Numerical modeling of mixing at the confluence zone of two rivers using a nested grid approach

S. Baranya[a], N.R.B. Olsen[b], J. Józsa[a]

[a] Water Management Team of the Hungarian Academy of Sciences. Department of Hydraulic and Water Resources Engineering, Budapest University of Technology and Economics. H-1111 Budapest Műegyetem rkp 3., Hungary, Tel.: 003614631164, Fax: 003614631879, E-mail: baranya@vit.bme.hu

[b] Department of Hydraulic and Environmental Engineering, Norwegian University of Science and Technology, S.P. Andersensvei 5, N-7491 Trondheim, Norway

A three-dimensional RANS model was used in this study to reveal the spatial flow structure of river confluence flows at the junction of River Mosoni-Duna and River Rába. Besides larger scale steady-state modeling, the unsteady behavior of the vertical shear layer between the merging rivers was also analyzed. The model was validated against detailed fixed and moving ADCP velocity profiling. Whereas the numerical domain was discretized with a structured grid for the large scale, steady simulations, a nested grid method, resulting in an unstructured mesh, was implemented to simulate the smaller scale vortex shedding. Calculating the transport of fine suspended sediment, the mixing effects of both the large scale helical flow system and the shear layer vortices were assessed.

Instantaneous pattern of suspended sediment concentration.