IMPROVING CHANNEL FLOW WITH DEFLECTORS OPTIMIZED USING A GENETIC ALGORITHM

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Abstract: *This paper summarizes the optimization process for deflectors designed to lower the water level and ceiling overflow in the S-shaped outflow channel of HPP Vinodol. Parameterized designs of deflectors were optimized using a genetic algorithm that evaluated each setup by running 2D CFD simulations. Optimal designs were chosen by considering total pressure loss and flow uniformity. The resulting best case design set provided a solid basis for simulations using 3D fluid flow numerical models of the channel. Two variants of 3D deflector designs were simulated and a two phase VoF model was used to simulate the free surface with and without deflectors. Both 2D and 3D simulation results show improvements in channel flow and a significantly lower water level justifies further development of deflector design for3D optimization and a future prototype test.*

Key words: *genetic algorithm, channel flow, deflector, shape optimization, CFD*

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