

The optimisation of wastewater treatment systems using adjoint solutions for CFD-based simulations

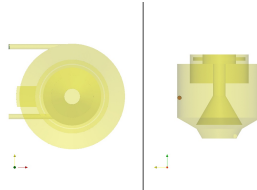
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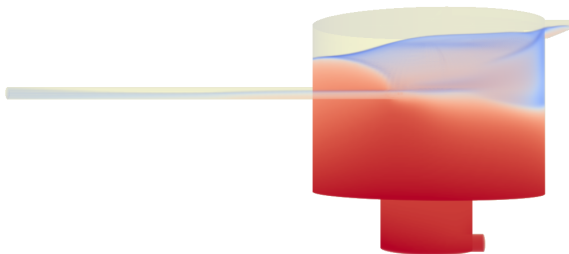
13th July 2016



Introduction

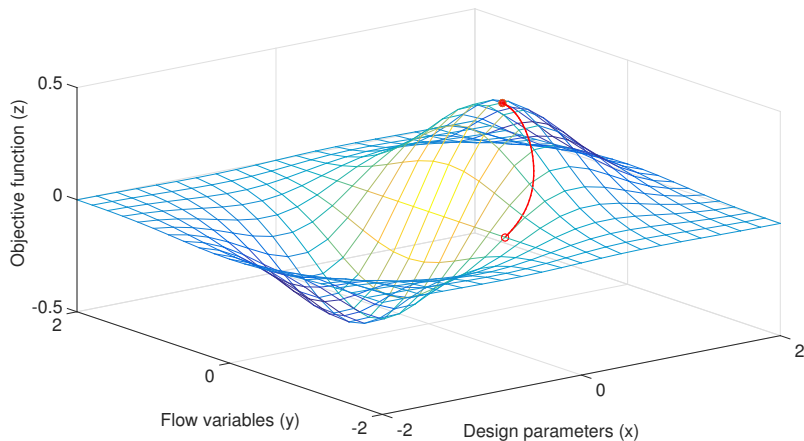


Objectives and objective functions

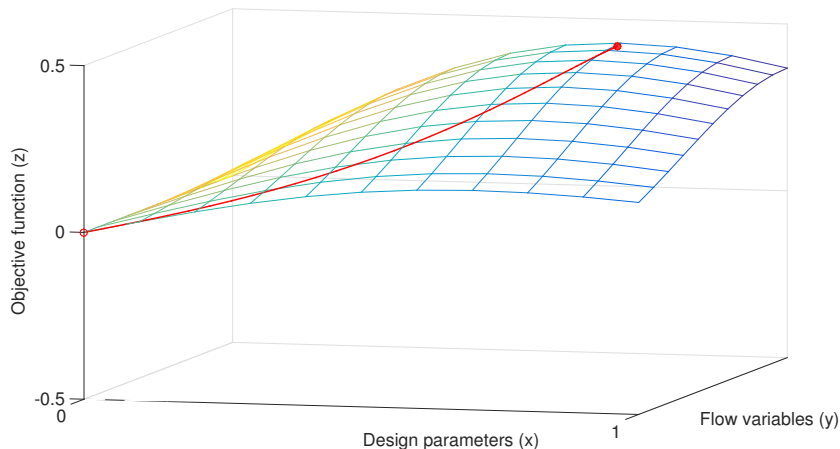


$$\text{Objective function} = \text{Flow of sludge through the underflow} - 2 \times \text{Flow of sludge through the overflow}$$

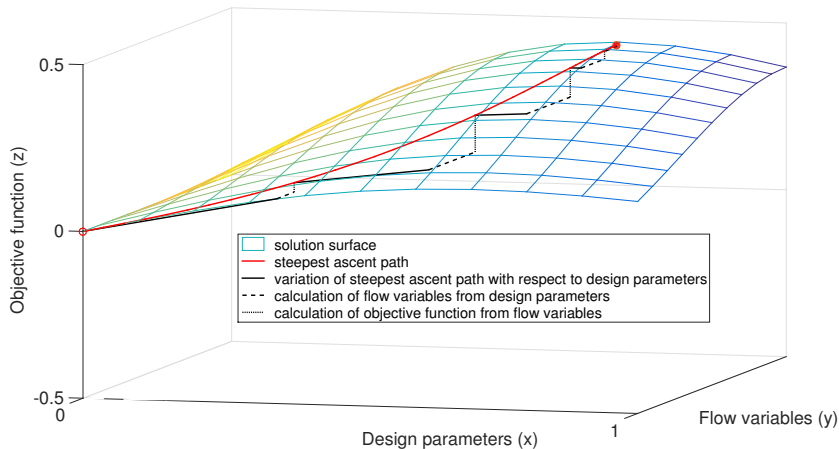
Graphical representation of the solution space



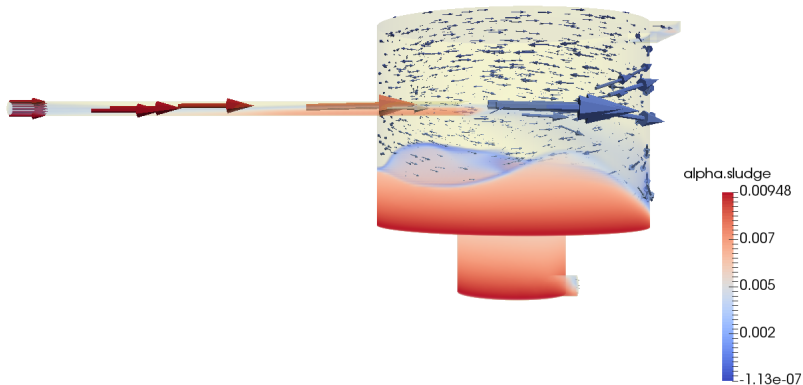
Graphical representation of the solution space



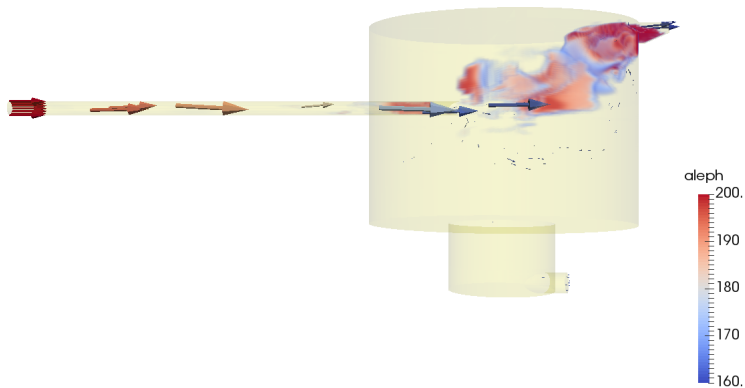
Graphical representation of the adjoint method



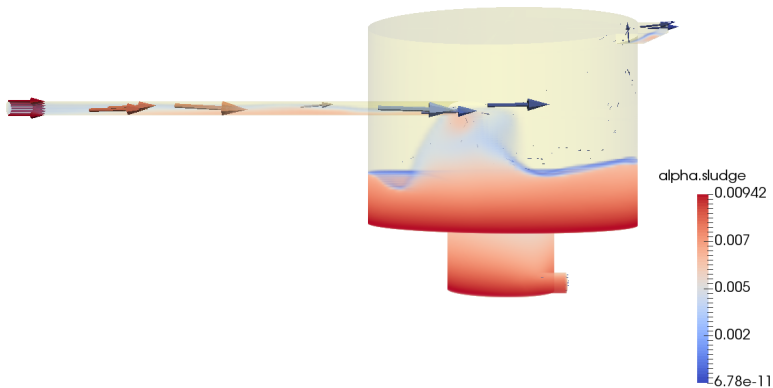
Existing design



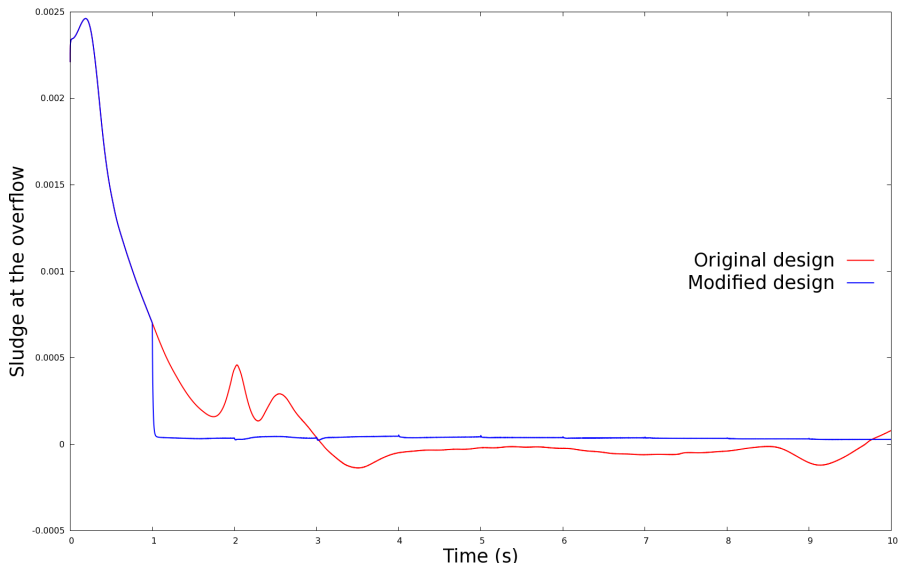
Which cells to block?



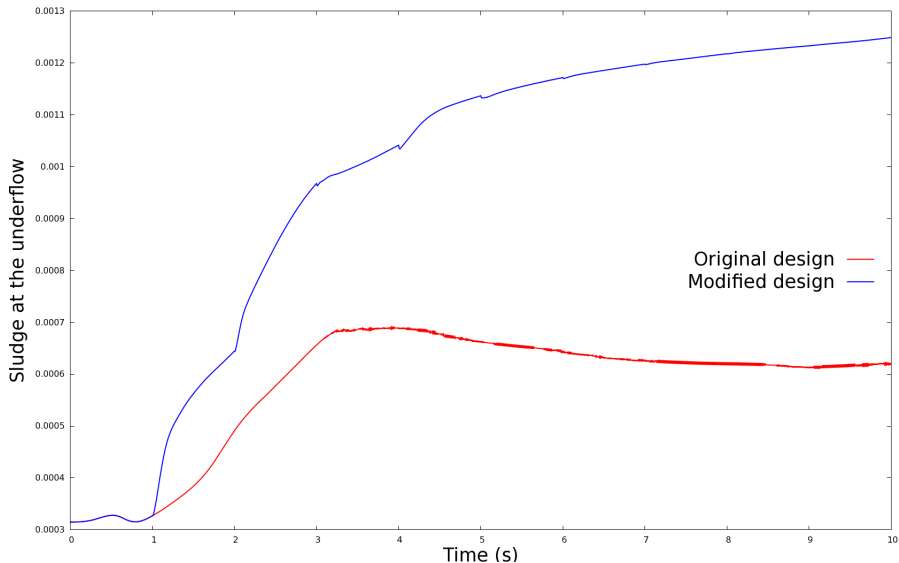
Modified design



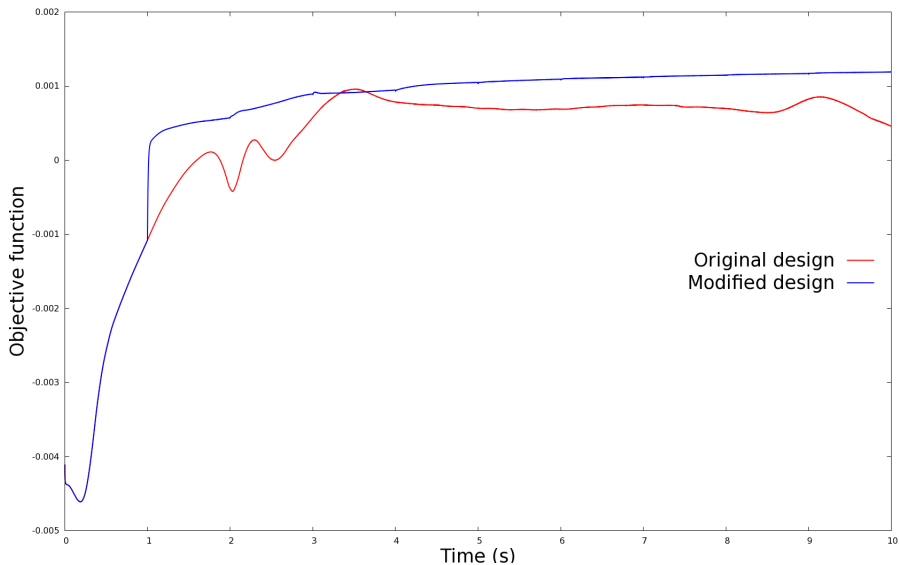
Comparison of sludge at the overflow



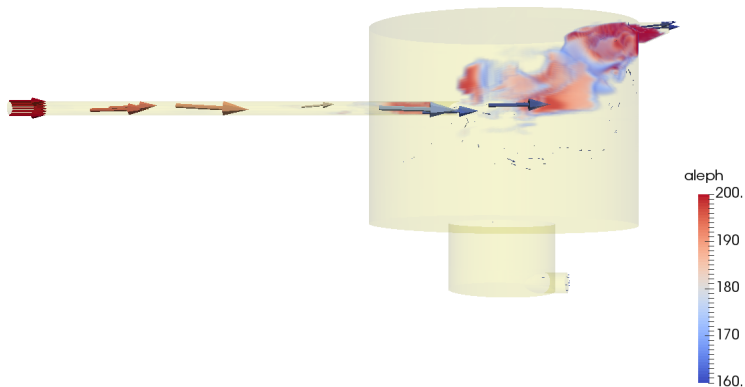
Comparison of sludge at the underflow



Comparison of the objective function



What next?



Thank you for listening

Any questions?