CFD simulations of Luleälven

> Mikael Hedberg

Introduction Experiments Simulations Results so far Questions

Trust in CFD for hydraulic design of open waterways and spillways

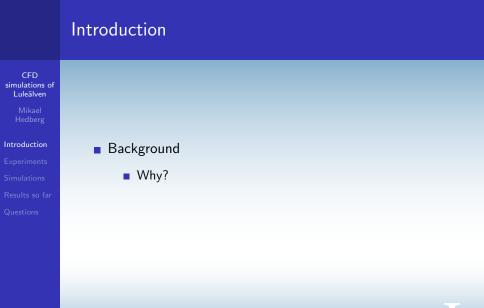
Mikael Hedberg

Luleå Tekniska Universitet

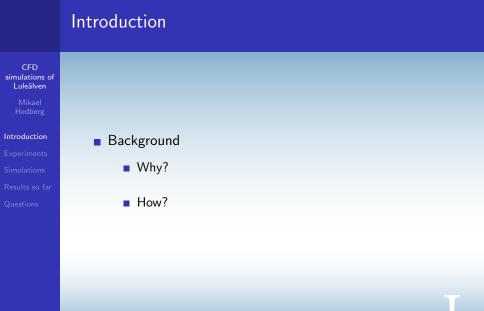
7 October



Introduction simulations of Luleälven Introduction Background

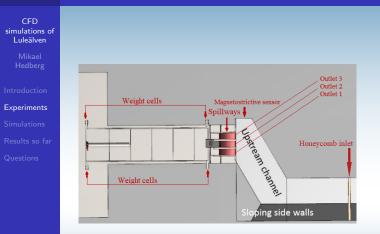






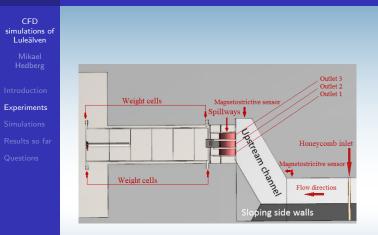


Experiments





Experiments





Experiments

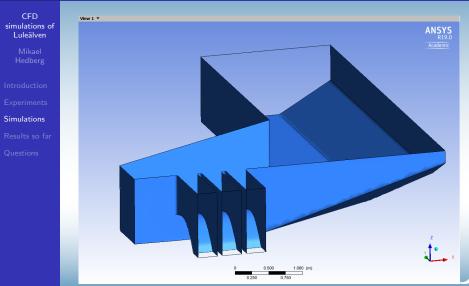
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Introduction Experiments Simulations Results so far Questions

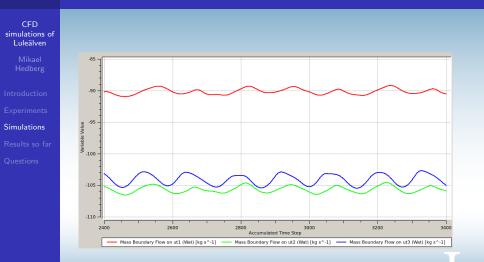


Model



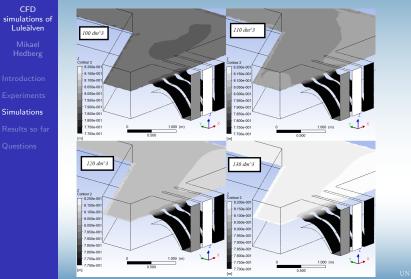
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Simulations, water outflow



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Simulations, water levels



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Results, experiments simulations of Luleälven Results Results so far



Results, experiments



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Introductio

Experiment

Simulation

Results so far

Questions

Results

Experiments against simulations

| Inlet flow | Outlet 1 | Outlet 1 | Outlet 2 | Outlet 2 | Outlet 3 | Outlet 3 |
|--------------------------|-----------|---------------|-----------|---------------|-----------|---------------|
| volume: | Simulated | Experiment | Simulated | Experiment | Simulated | Experiment |
| 90 [dm ³ /s] | 33.16 | 33.58 (-0.41) | 33.45 | 33.64 (-0.22) | 33.41 | 33.52 (-0.12) |
| 100 [dm ³ /s] | 33.15 | 32.67 (0.48) | 33.47 | 31.09 (2.23) | 33.34 | 33.81 (-0.45) |
| 110 [dm ³ /s] | 33.18 | 32.98 (0.19) | 33.49 | 33.76 (-0.26) | 33.34 | 33.24 (0.15) |
| 120 [dm ³ /s] | 33.18 | 33.56 (-0.38) | 33.54 | 33.12 (0.4) | 33.35 | 33.18 (0.12) |
| 130 [dm ³ /s] | 33.23 | 33.60 (-0.27) | 33.56 | 33.93 (-0.3) | 33.24 | 33.82 (-0.54) |



Results, experiments



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Introductio

Experiment

Simulation

Results so far

Questions

Results

Experiments against simulations

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| | Questions? |
|---|----------------|
| CFD simulations of Luleälven Mikael Hedberg | |
| Introduction Experiments Simulations Results so far Questions | Any Questions? |

