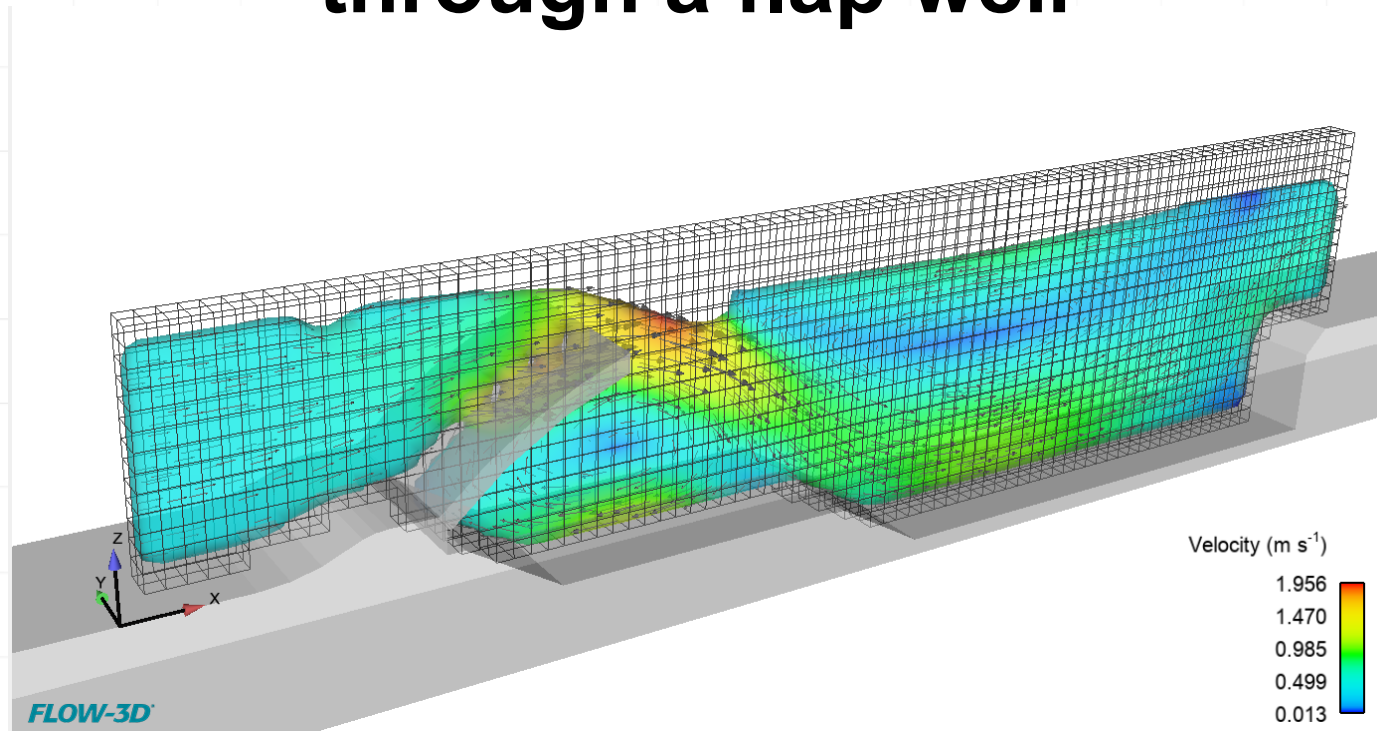


Impact of mesh size in CFD analysis on the accuracy of modelling different-scale hydraulic phenomena during the flow through a flap weir



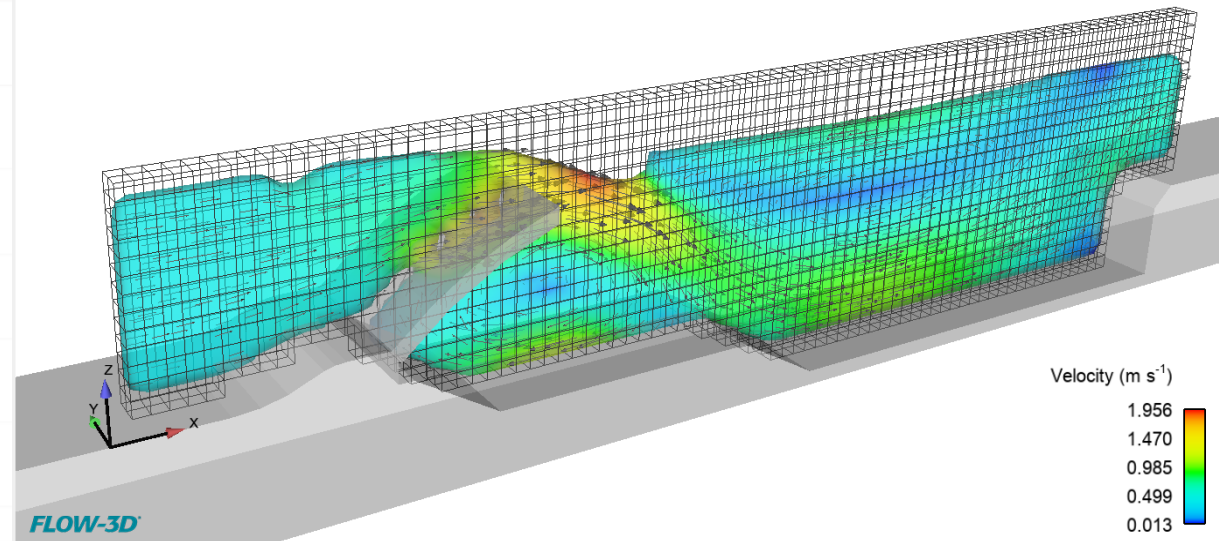
Krzysztof Zamiar

My Master's thesis as background

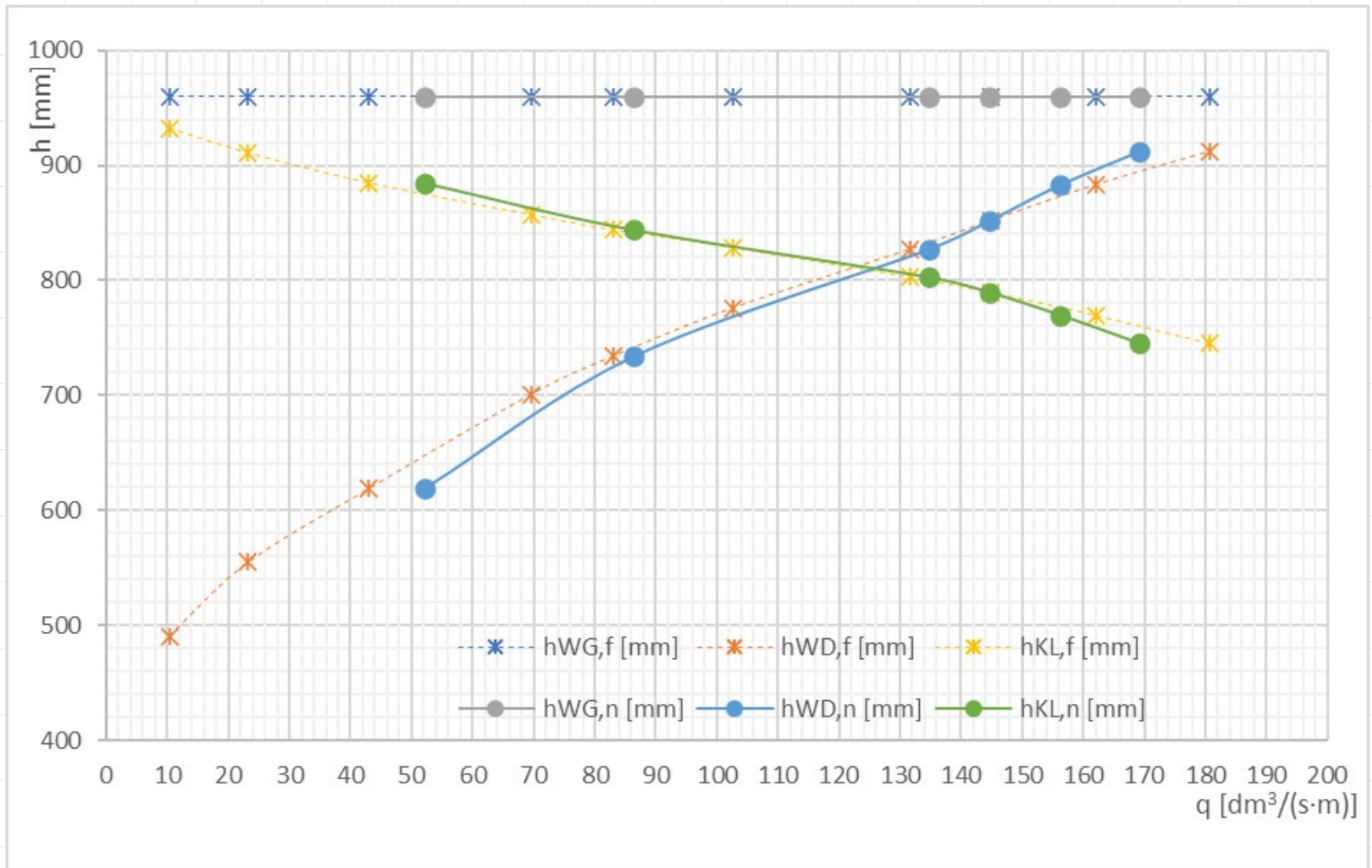


1:10 scale physical model in the hydraulic laboratory at the Wrocław University of Science and Technology.

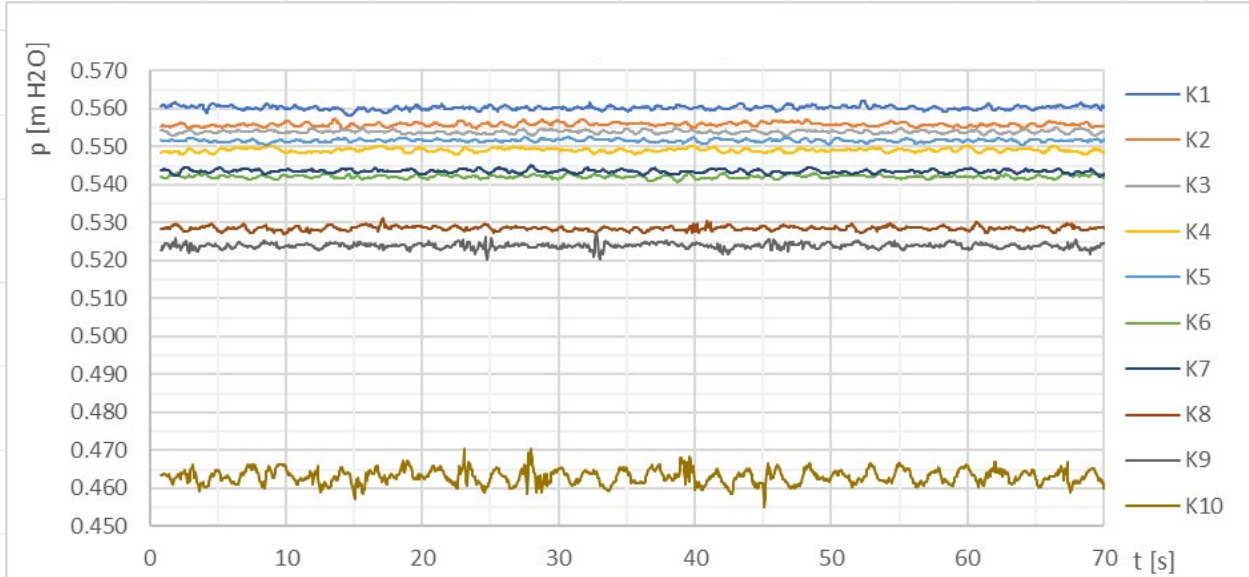
Identical model in FLOW-3D software to compare physical and CFD modelling. Large eddy simulation with 10 mm mesh size.



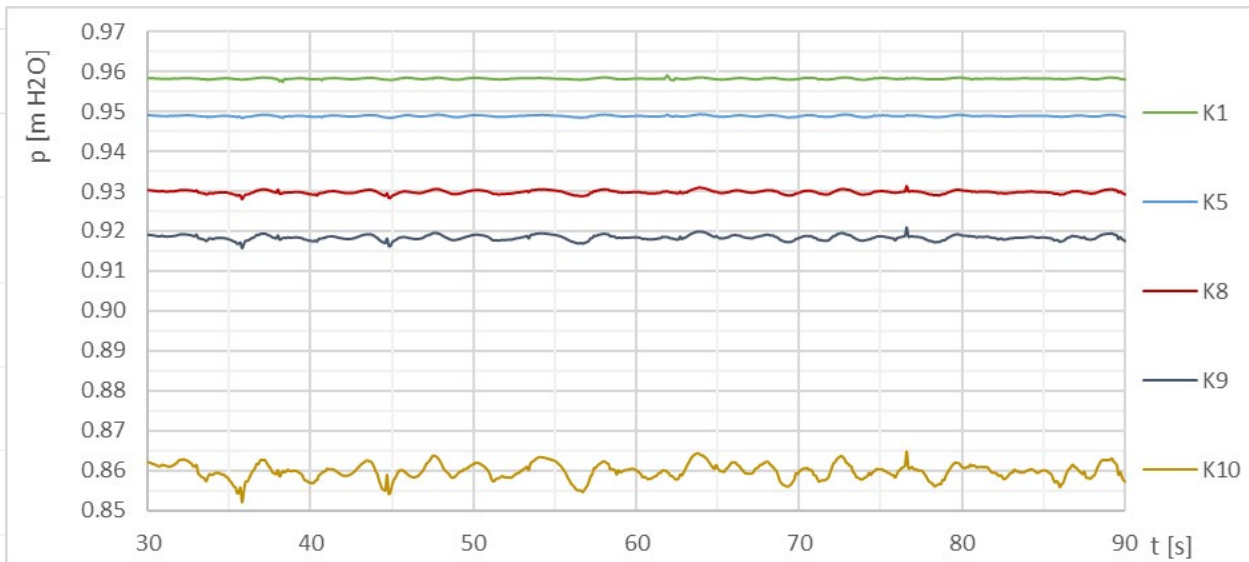
Average flow measurement



Pressure at points on the flap surface



Pressure at points on physical model in time

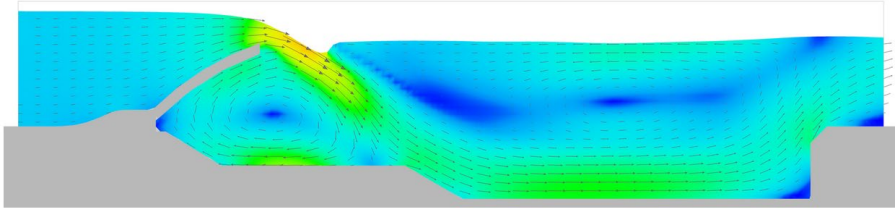


Pressure at points on numerical model in time

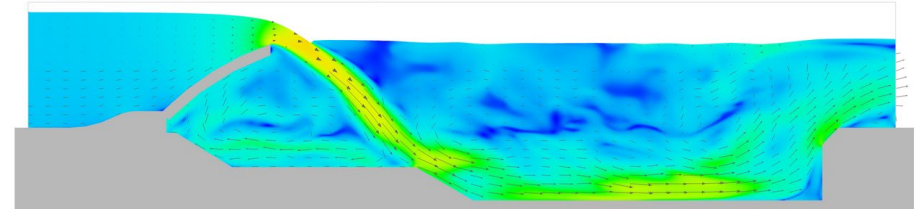
**In the numerical model, the zero level was set 0.40 m lower than in the physical model.*

Research of mesh size impact

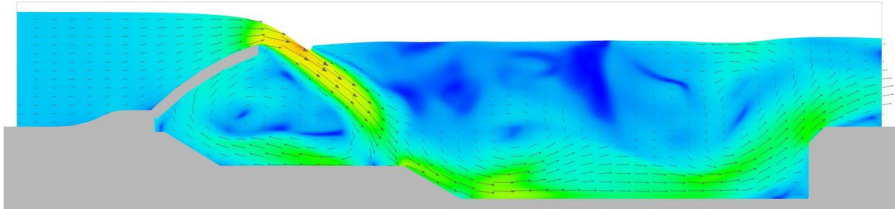
Case #1
Mesh size: 0,030 m
Number of cels: 13 860
Computation time: 2 min



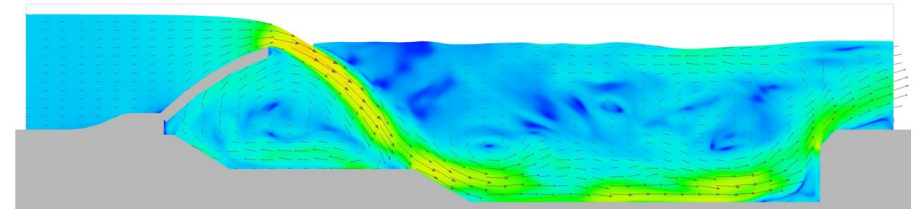
Case #4
Mesh size: 0,006 m
Number of cels: 1 987 300
Computation time: 440 min



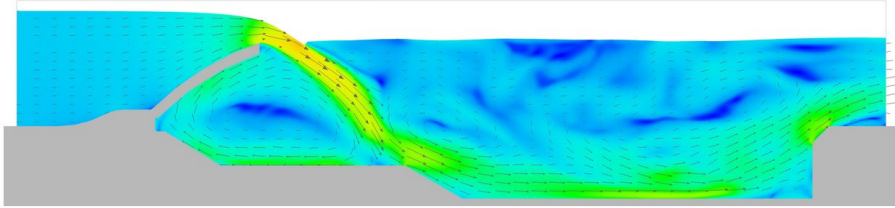
Case #2
Mesh size: 0,010 m
Number of cels: 420 000
Computation time: 36 min



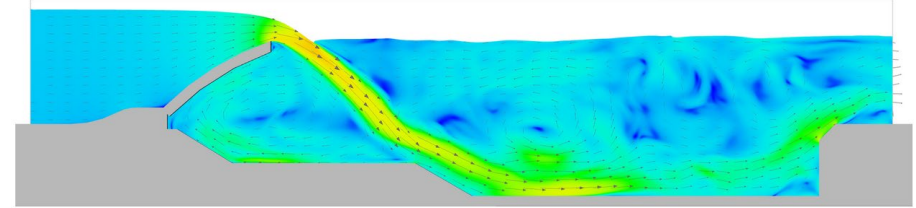
Case #5
Mesh size: 0,005 m
Number of cels: 3 360 000
Computation time: 1170 min



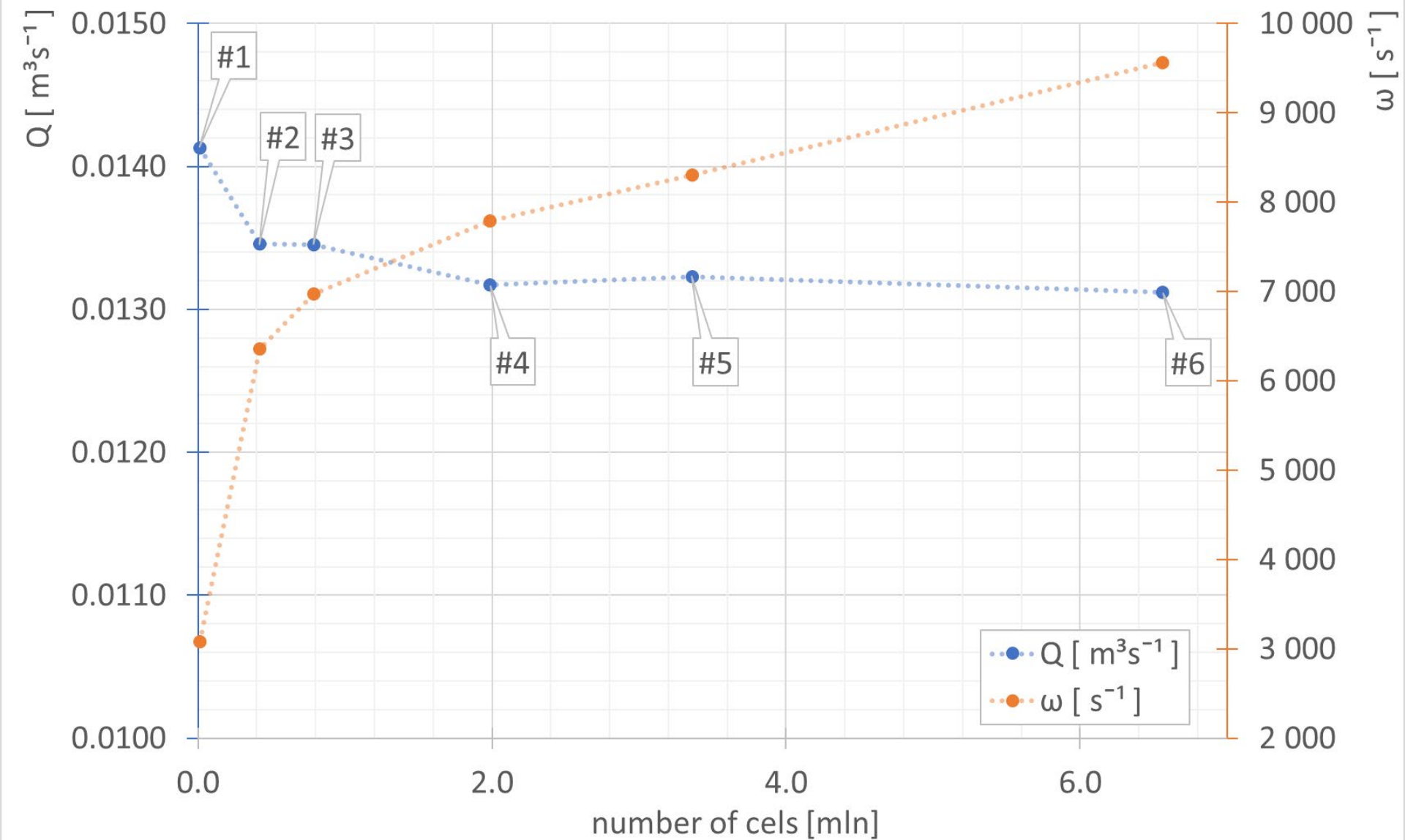
Case #3
Mesh size: 0,008 m
Number of cels: 787 500
Computation time: 145 min



Case #6
Mesh size: 0,004 m
Number of cels: 6 562 500
Computation time: 4425 min



Results



Thank you

you are welcome to ask
during the poster session



Contact me:

LinkedIn profile: (QR)

Mail: krzysztof.zamiar@pwr.edu.pl

