

The background of the slide is an aerial photograph of a river. The river is dark blue, and there are several large, irregularly shaped ice jams or icebergs floating in it. The ice is a light brownish-grey color. In the top right corner, there is a solid green rectangular bar.

River-Ice; Run-Off and Jamming

PHYSICAL AND NUMERICAL MODELLING

TIM ROHM – PHD CANDIDATE – MARINE CIVIL ENGINEERING

Problem:



Ice movement in rivers is inherently complex



Infrastructure damage



Flooding

SAMS & REEF3D

SAMS; Simulator for Arctic Marine Structures

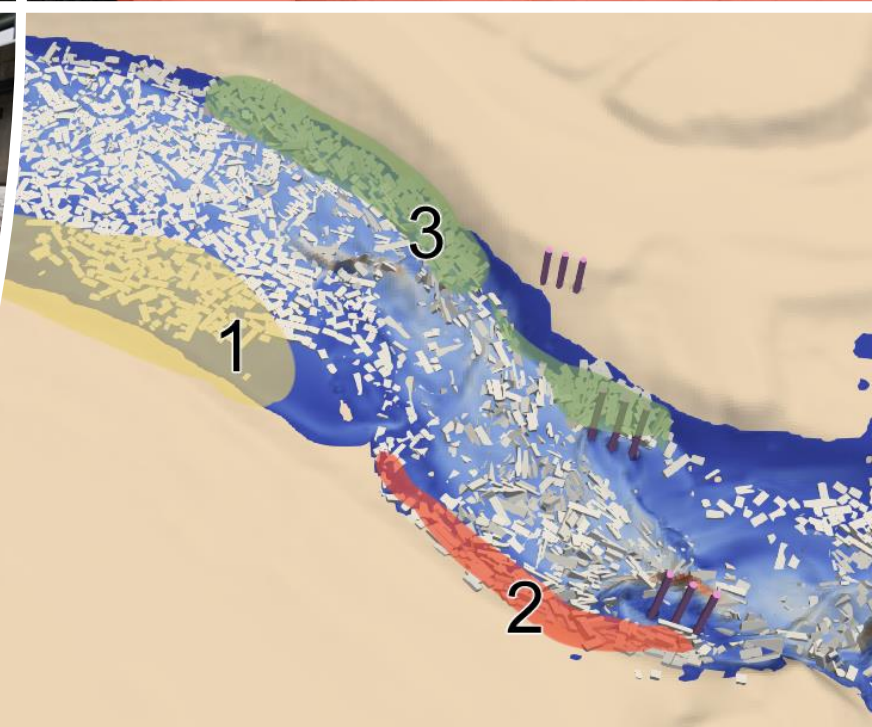
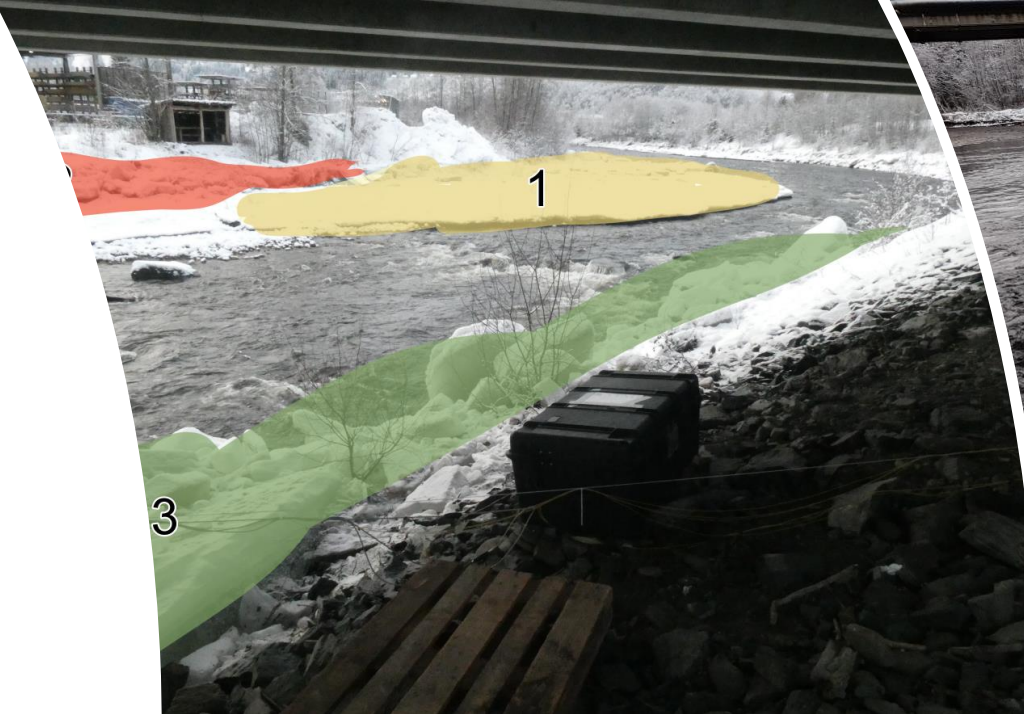
- Excellent handling of forces
- 1D Flow
- Can simulate tens of thousands of ice floes

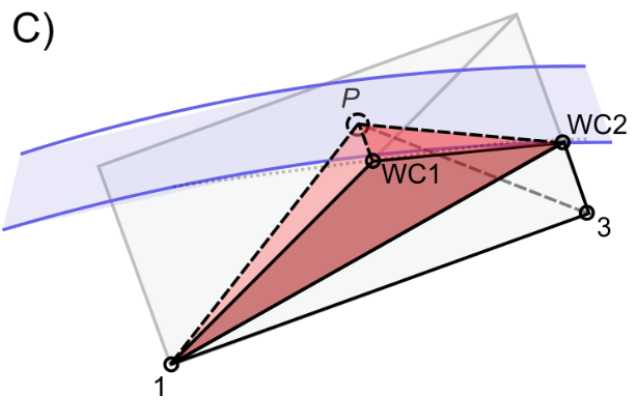
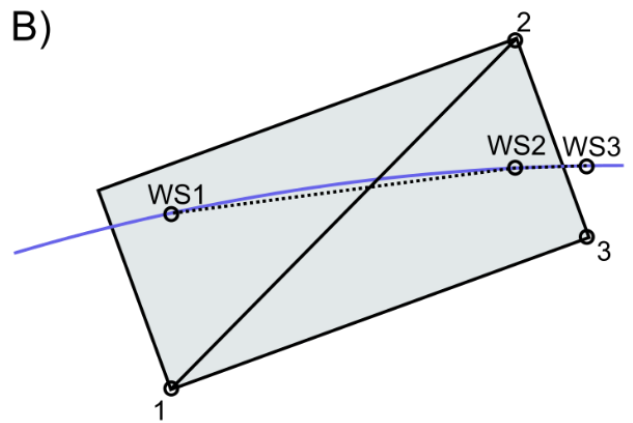
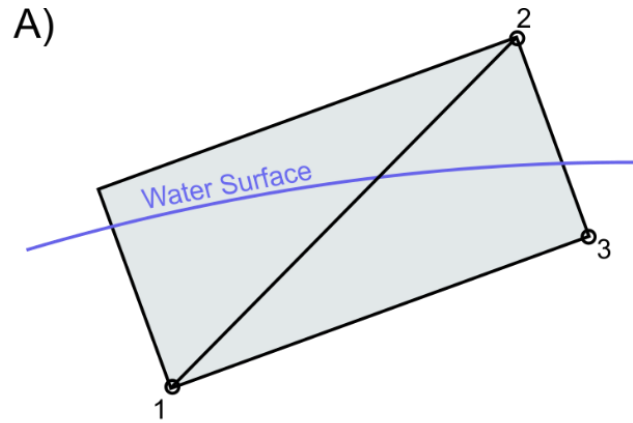
REEF3D : Open-Source Hydrodynamics

- Several excellent models
- Very fine control over flow simulation

SAMS Upgrades; Bathymetry

- Can have almost any shape
- Friction and Collision
- No force calculations

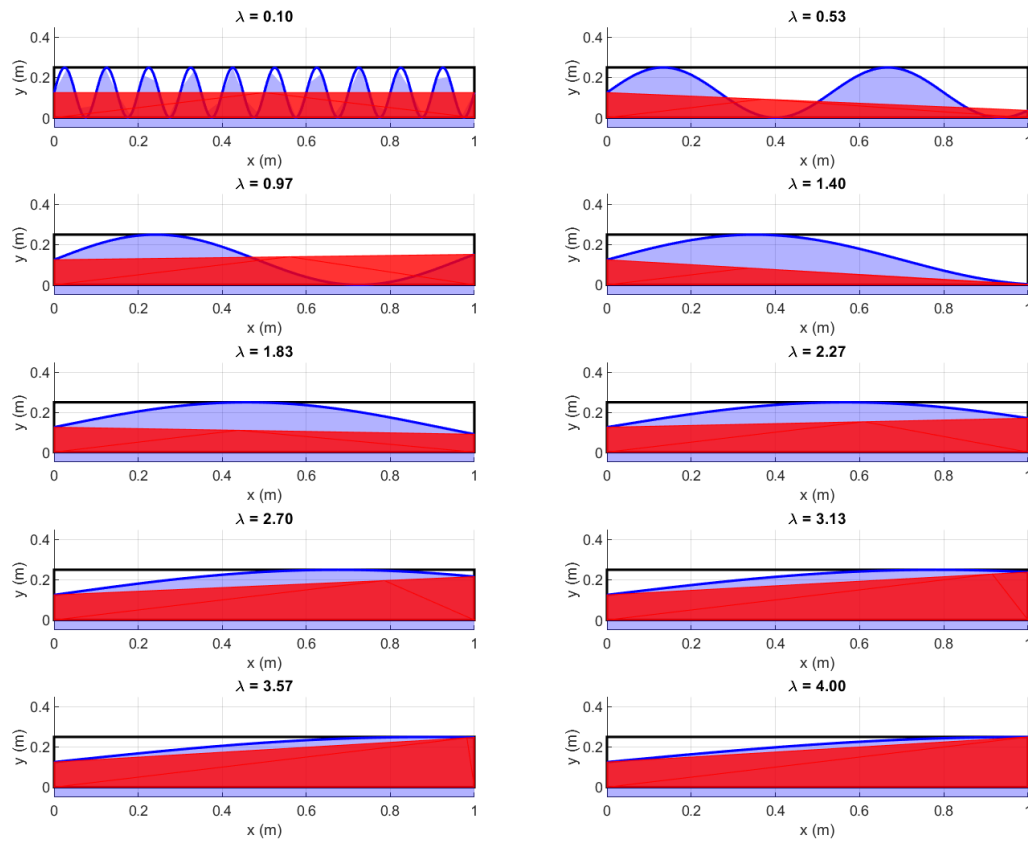




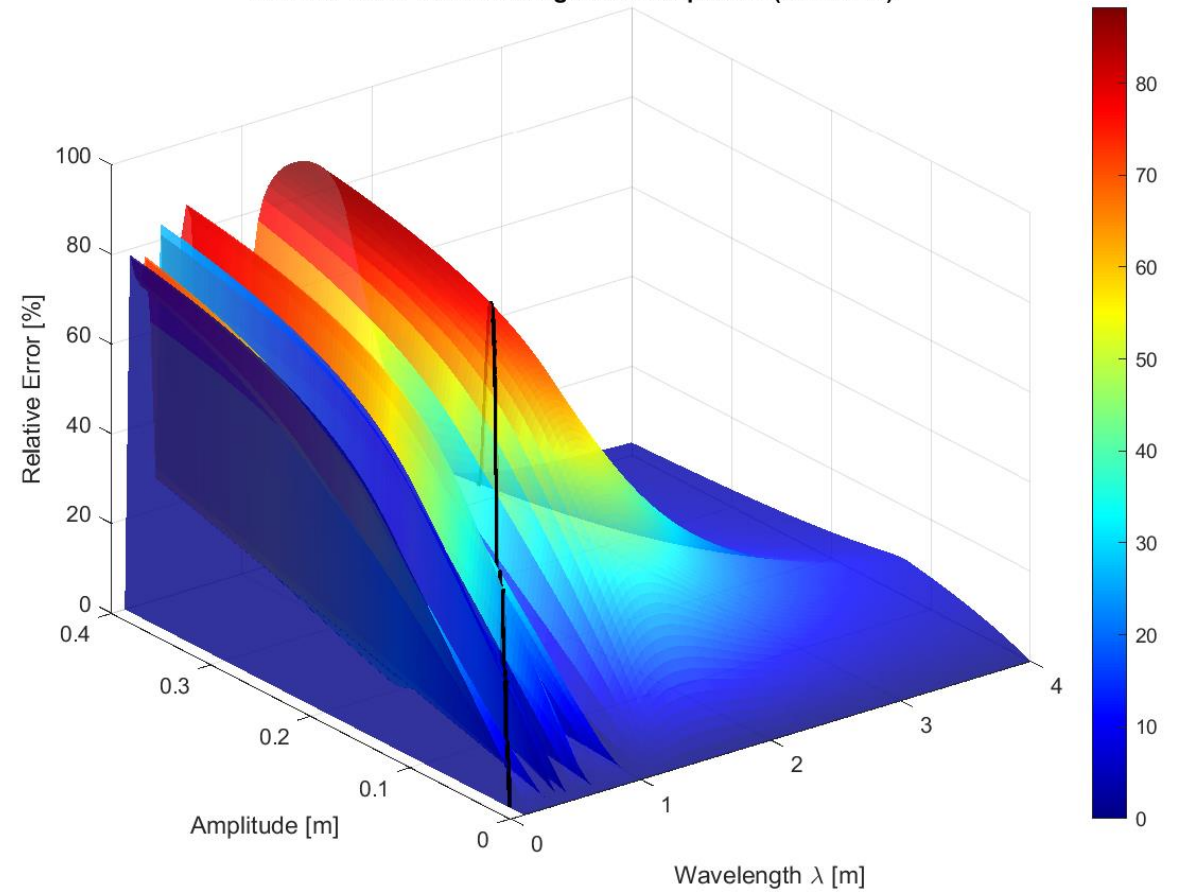
SAMS Upgrades; Bouyancy

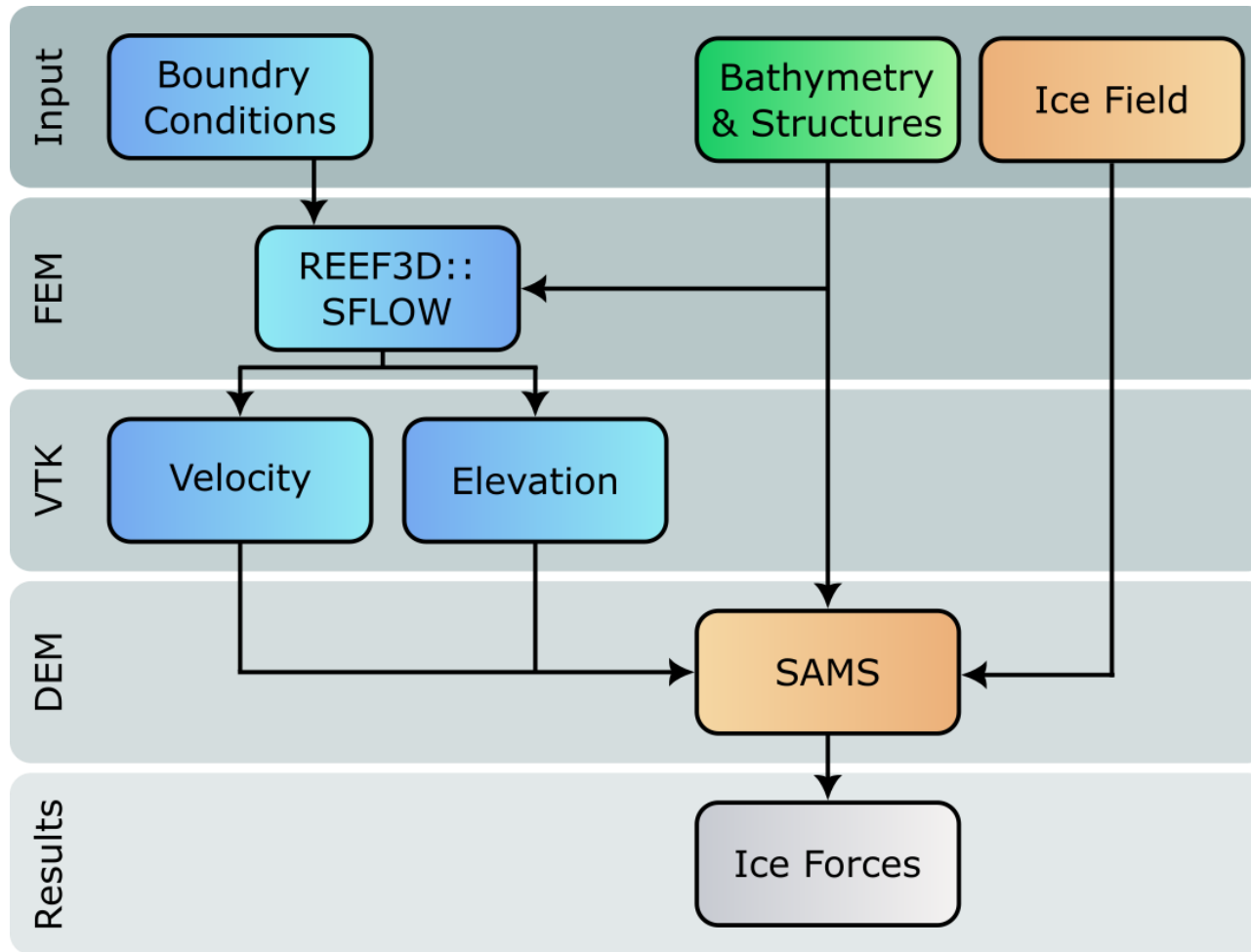
Geometry

2-Triangle Floe: Ice, Wave, & Submerged Area



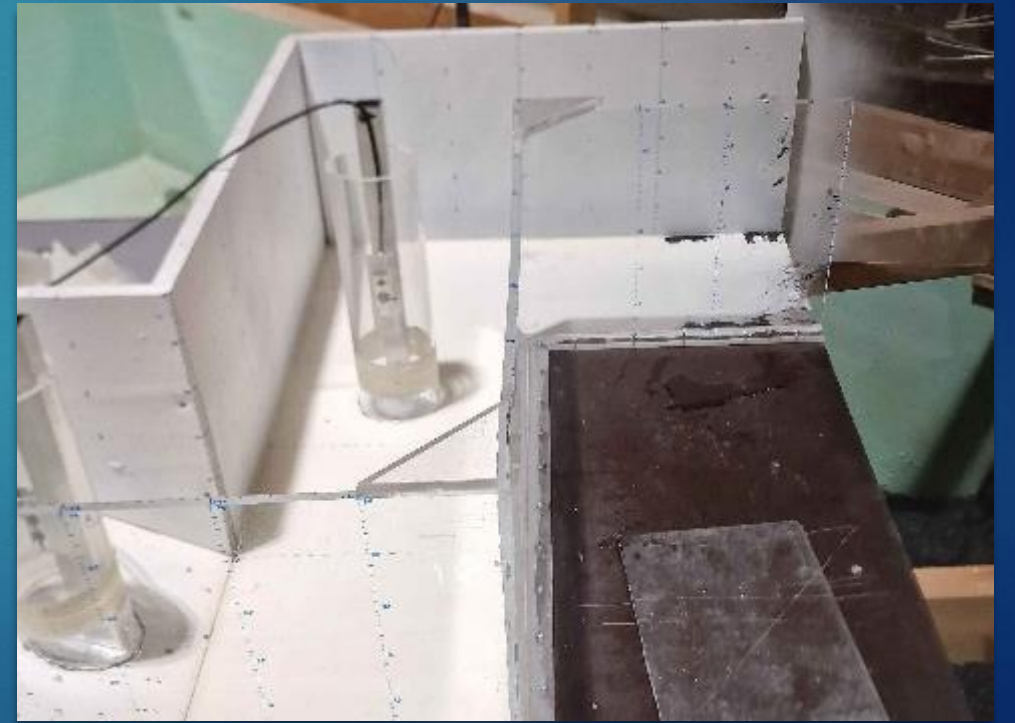
Relative Error vs. Wavelength and Amplitude (Standard)

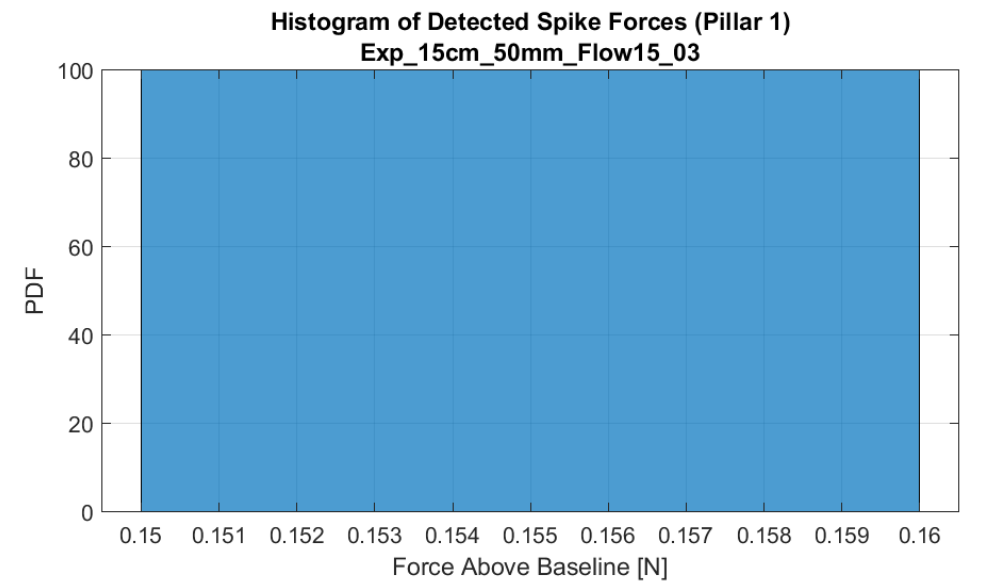
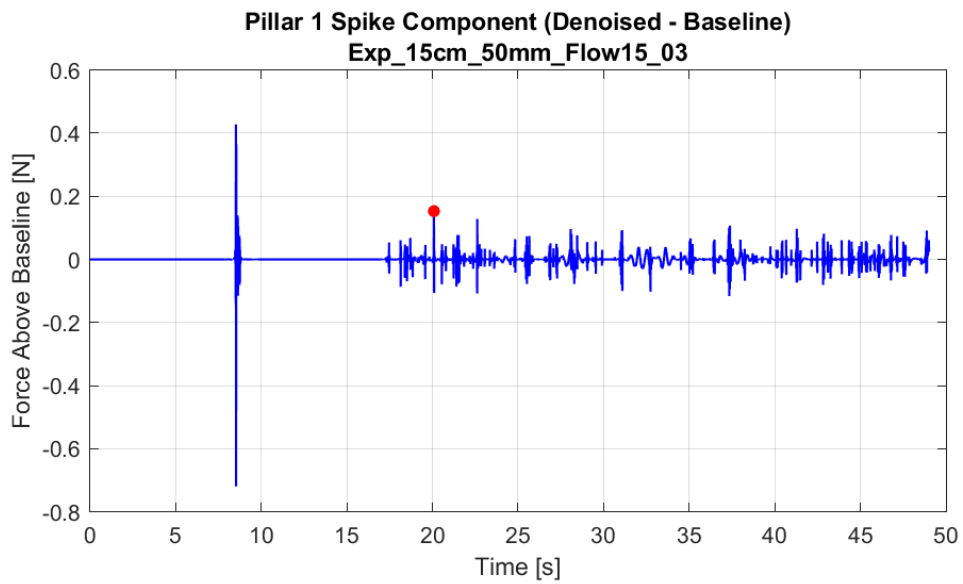
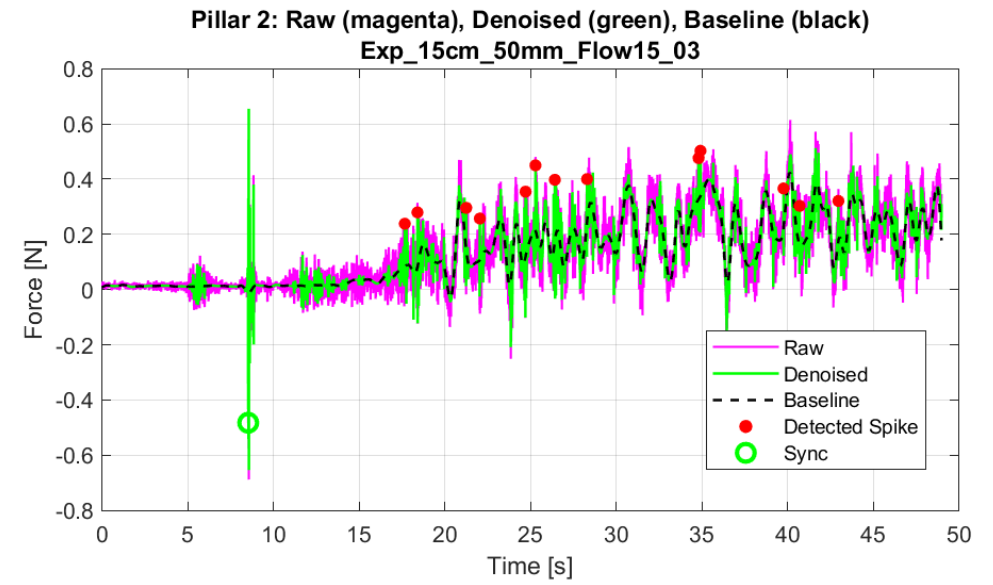
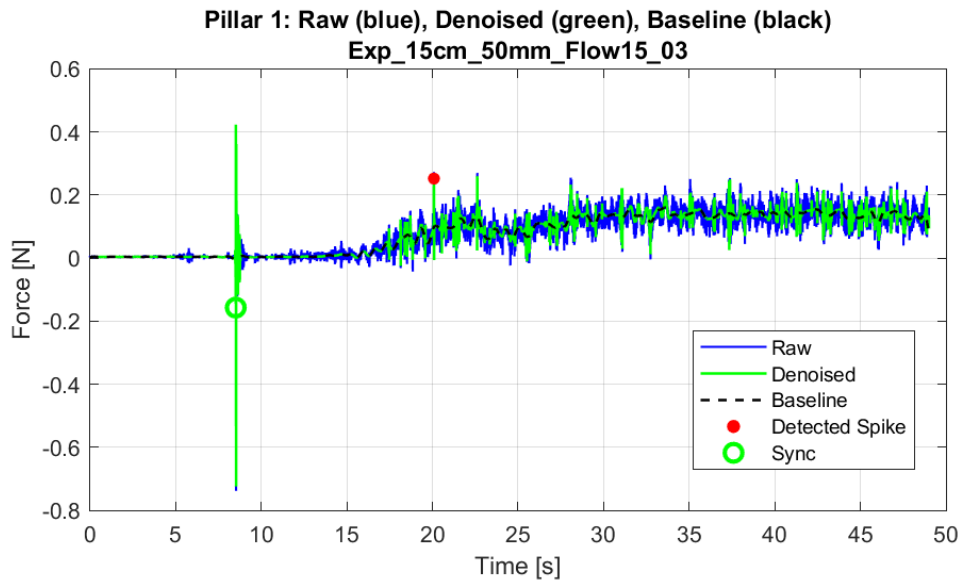




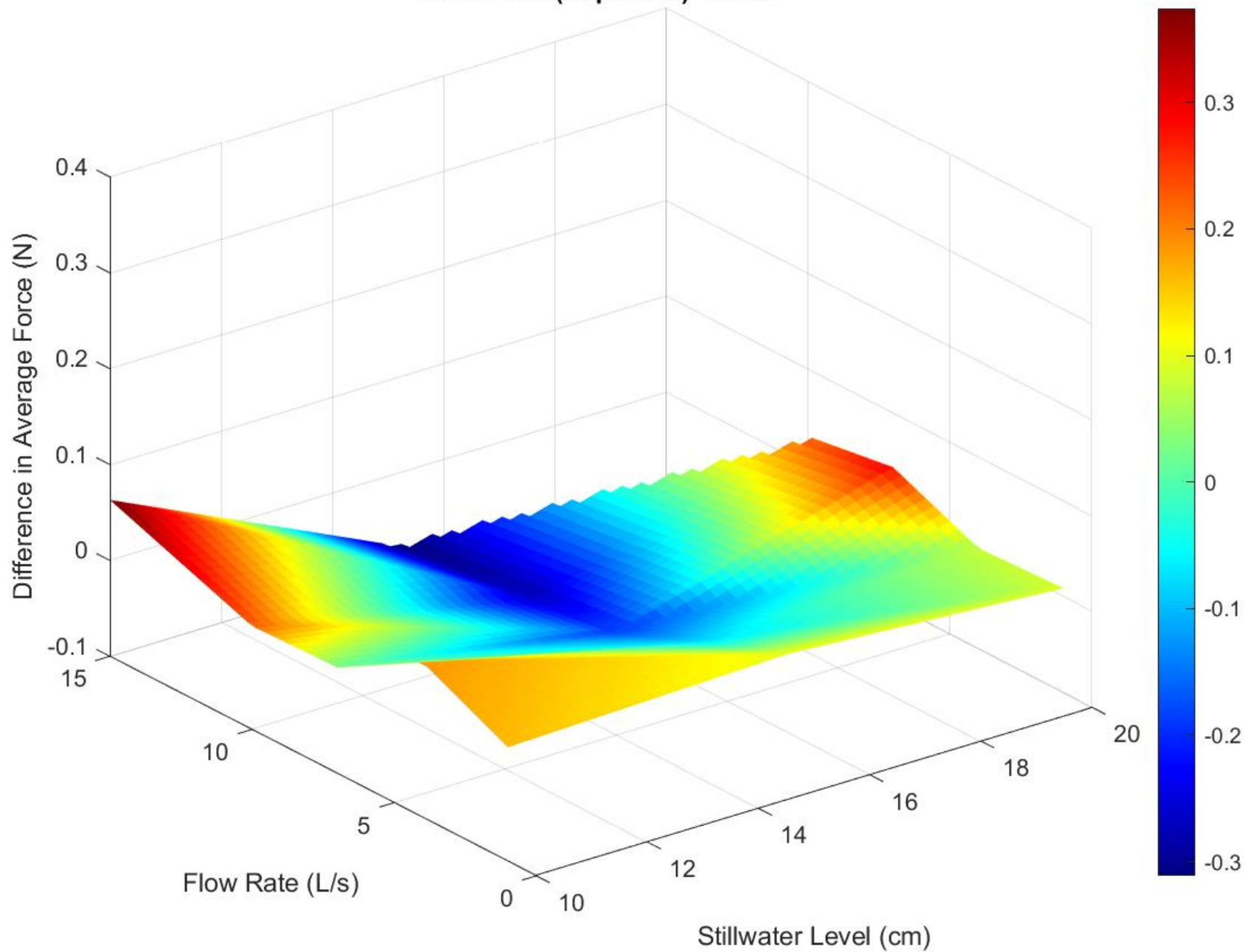
One Way
Coupling

Physical Experiments





Difference (Exp - Sim): 50mm



Overaggregated Results

AllData_ExpVsSim

