SPH Method on a dam break case

Task 1 : For the initial geometry, compare the required computational time of a CPU and a GPU run

I run the computation on my computer:

- For GPU computational time : 4 minutes, 30 seconds minutes (NVIDIA GTX 1050)
- For CPU computational time : around 5 hours (Intel i7-8565U)

Task 2 : Modify the geometry of the model, generate it and export its figure from Paraview.

The basic geometry

```xml
<geometry>
    <definition dp="0.0085" units_comment="metres (m)">
      <pointmin x="-0.05" y="-0.05" z="-0.05" />
      <pointmax x="2" y="1" z="1" />
    </definition>
    <commands>
      <mainlist>
        <setshapemode>dp | bound</setshapemode>
        <setdrawmode mode="full" />
        <setmkfluid mk="0" />
        <drawbox>
          <boxfill>solid</boxfill>
          <point x="0" y="0" z="0" />
          <size x="0.4" y="0.67" z="0.3" />
        </drawbox>
        <setmkbound mk="0" />
        <drawbox>
          <boxfill>bottom | left | right | front | back</boxfill>
          <point x="0" y="0" z="0" />
          <size x="1.6" y="0.67" z="0.4" />
        </drawbox>
        <shapeout file="Box"/>
        <setmkvoid />
        <drawbox>
          <boxfill>solid</boxfill>
          <point x="0.9" y="0.24" z="0" />
```
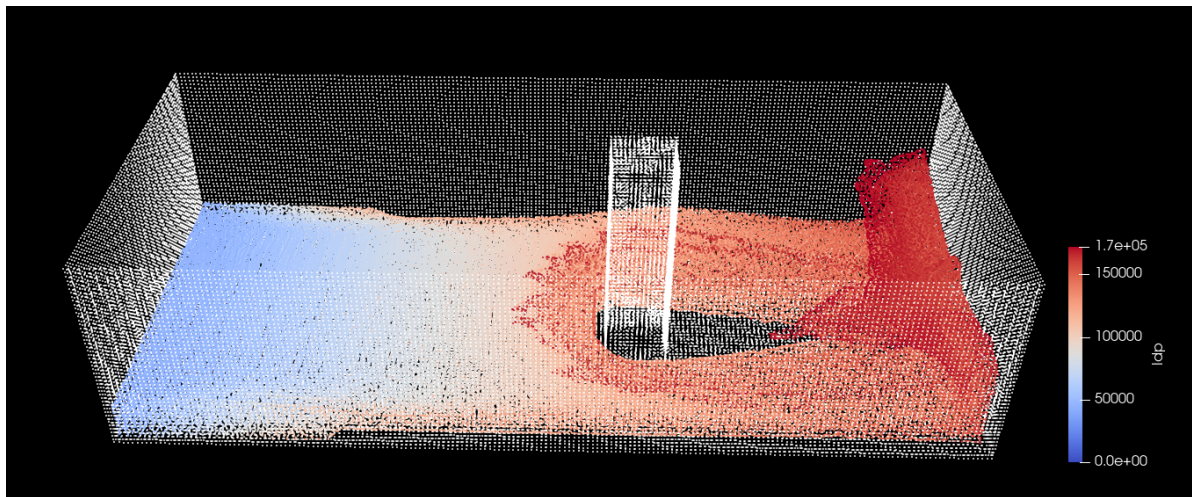
```xml
                <size x="0.12" y="0.12" z="0.45" />
            </drawbox>
            <setmkbound mk="1" />
            <drawbox>
                <boxfill>top | left | right | front | back</boxfill>
                <point x="0.9" y="0.24" z="0" />
                <size x="0.12" y="0.12" z="0.45" />
            </drawbox>
            <setmkbound mk="10" />
            <drawbox>
                <boxfill>left</boxfill>
                <point x="0.9" y="0.24" z="0" />
                <size x="0.12" y="0.12" z="0.45" />
            </drawbox>
            <shapeout file="Building"/>
        </mainlist>
    </commands>
</geometry>
```


Modified geometry

```xml
<geometry>
    <definition dp="0.0085" units_comment="metres (m)">
        <pointmin x="-0.05" y="-0.05" z="-0.05" />
        <pointmax x="2" y="1" z="1" />
    </definition>
    <commands>
        <mainlist>
            <setshapemode>dp | bound</setshapemode>
            <setdrawmode mode="full" />
            <setmkfluid mk="0" />
            <drawbox>
                <boxfill>solid</boxfill>
                <point x="0" y="0" z="0" />
                <size x="0.4" y="0.67" z="0.3" />
            </drawbox>
            <setmkbound mk="0" />
            <drawbox>
                <boxfill>bottom | left | right | front | back</boxfill>
                <point x="0" y="0" z="0" />
                <size x="1.2" y="0.67" z="0.4" />
            </drawbox>
```
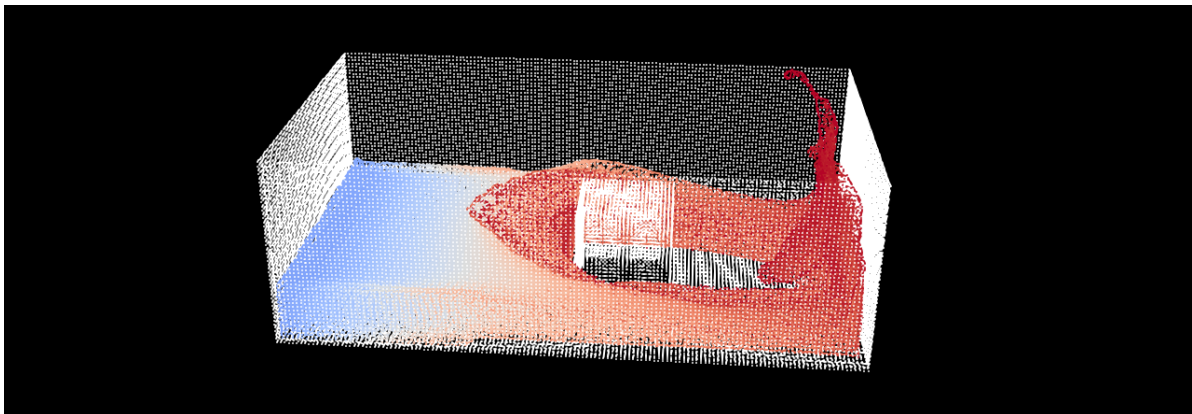
```xml
        <shapeout file="Box"/>
        <setmkvoid />
        <drawbox>
          <boxfill>solid</boxfill>
          <point x="0.6" y="0.24" z="0" />
          <size x="0.20" y="0.20" z="0.20" />
        </drawbox>
        <setmkbound mk="1" />
        <drawbox>
          <boxfill>top | left | right | front | back</boxfill>
          <point x="0.6" y="0.24" z="0" />
          <size x="0.20" y="0.20" z="0.20" />
        </drawbox>
        <setmkbound mk="10" />
        <drawbox>
          <boxfill>left</boxfill>
          <point x="0.6" y="0.24" z="0" />
          <size x="0.20" y="0.20" z="0.20" />
        </drawbox>
        <shapeout file="Building"/>
      </mainlist>
    </commands>
  </geometry>
```
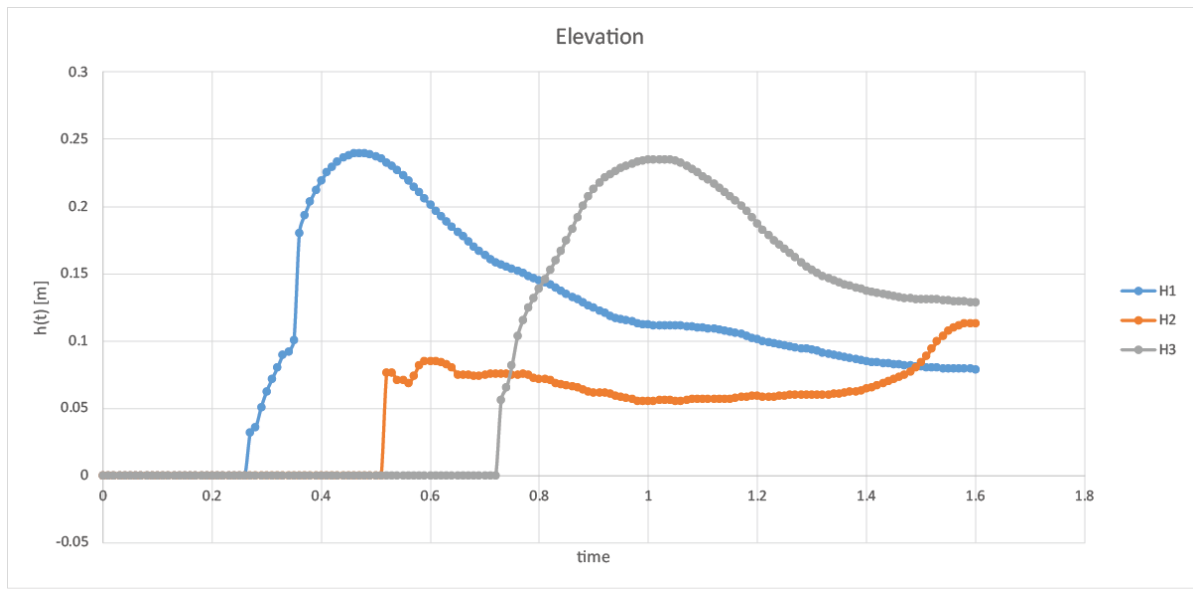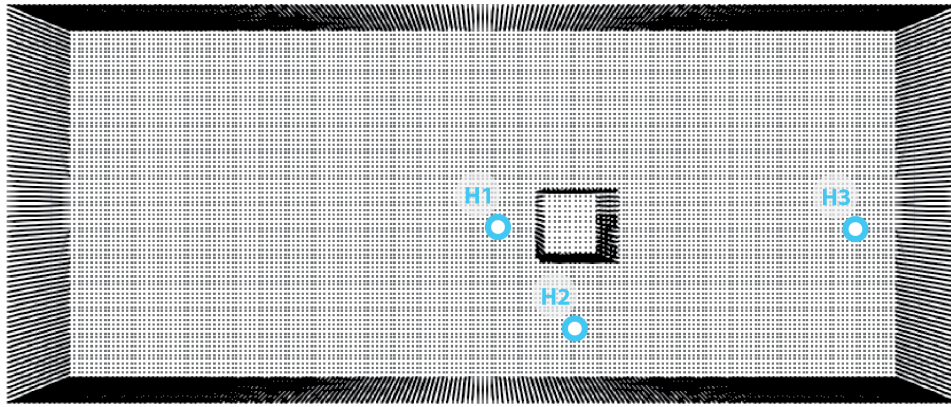

Task 3 : For the initial geometry, make a screenshot of an animation showing the water flushing against the object or the downstream wall

Task 4 : For the initial geometry, show time-series graphs of water surface elevations in the selected points

Elevation

Task 5 : For the initial geometry, show time-series graphs of forces acting upon the object

Forces