

SPH Method on a dam break case

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

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

The basic geometry

Modified 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

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.

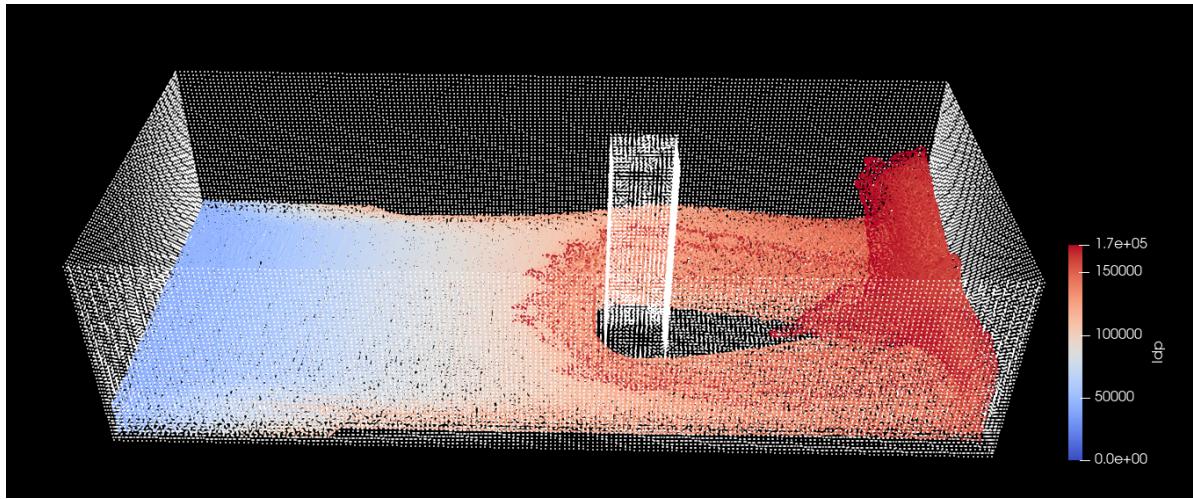
The basic geometry

```
<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" />
        <size x="0.12" y="0.12" z="0.45" />
      </drawbox>
    </mainlist>
  </commands>
</geometry>
```

```

</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

```

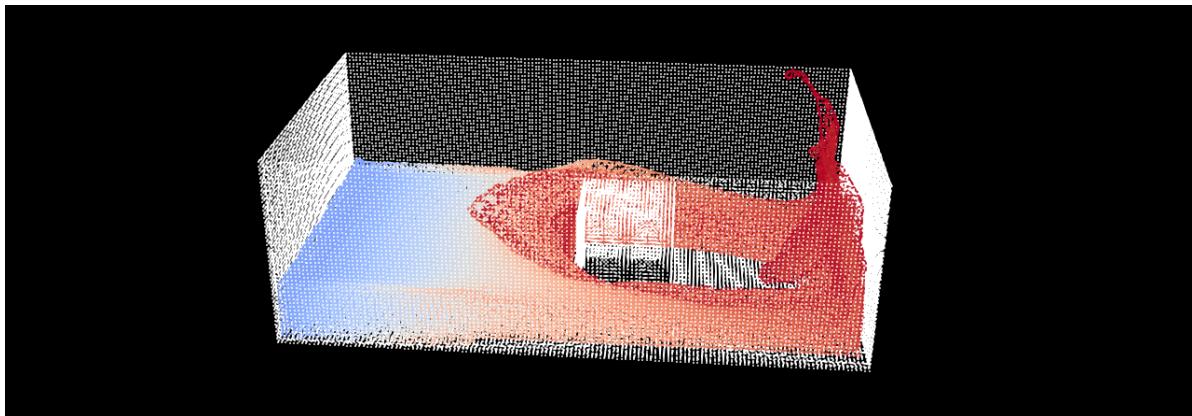
<geometry>
  <definition dp="0.0085" units_comment="metres (m)">
    <pointmin x="-0.05" y="-0.05" z="-0.05" />
    <pointmax x="2" y="1" z="1" />
  </definition>
  <commands>
    <mainlist>
      <setshapemode>dp | bound</setshapemode>
      <setdrawmode mode="full" />
      <setmkfluid mk="0" />
      <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>
      <shapeout file="Box"/>
    </mainlist>
  </commands>
</geometry>

```

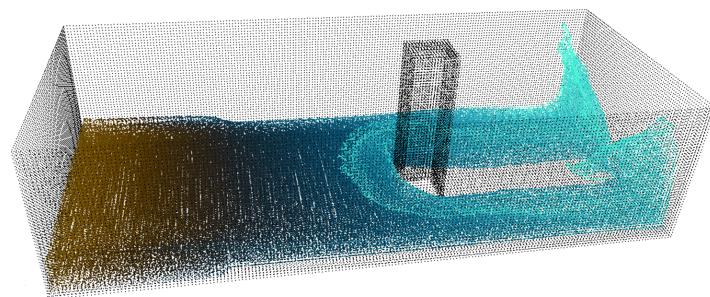
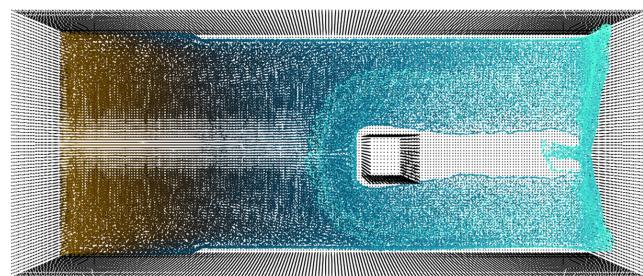
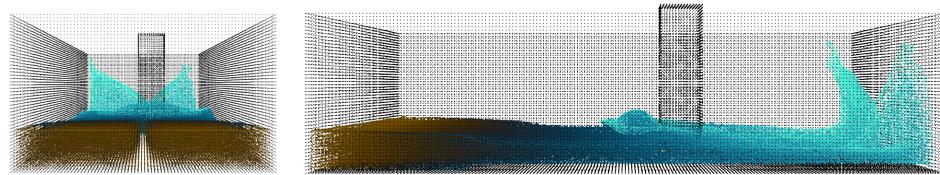
```

<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