

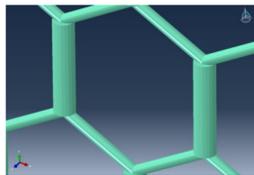
# Modeling Aquaculture PET Net with the Use of Finite Element Method

By: **Claudia Casanova & Widyasatka Dwikartika**  
 Supervisor: **Harald Ellingsen**  
 Co-supervisor: **Arne Fredheim**

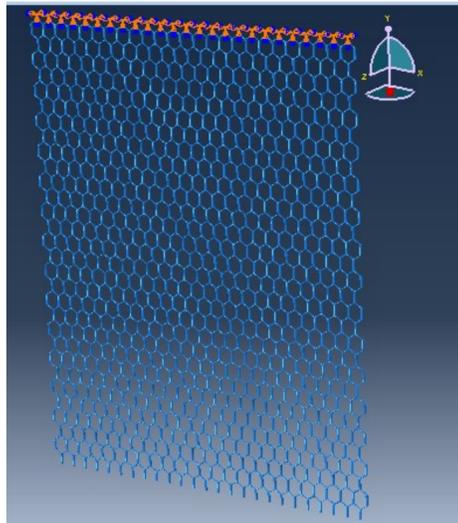
## MODELING



PET net



PET mesh modeling



Net panel modeling

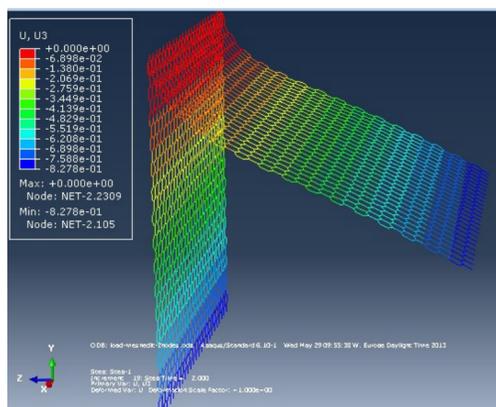
## INTRODUCTION

The growth of the fish farm industry in Norway over the past decades was supported by new designs and materials for fish farm, allowing bigger fish cages to be located in more exposed areas. When exposed to current, a net cage changes shape by deflection and deformation. Therefore, advancements in the Engineering analysis of nets are needed to improve design, performance and reliability of such structures.

## OBJECTIVES

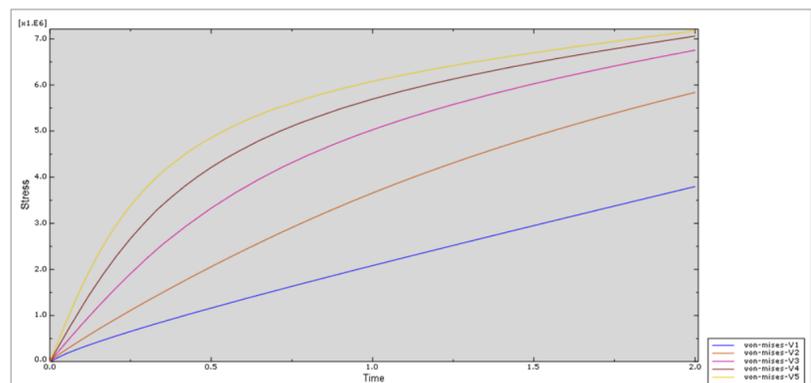
- Construct the model in ABAQUS according to the features of PET net
- Deformation analysis of PET net
- Comparison of the result between ABAQUS and SINTEF experiment

## RESULTS



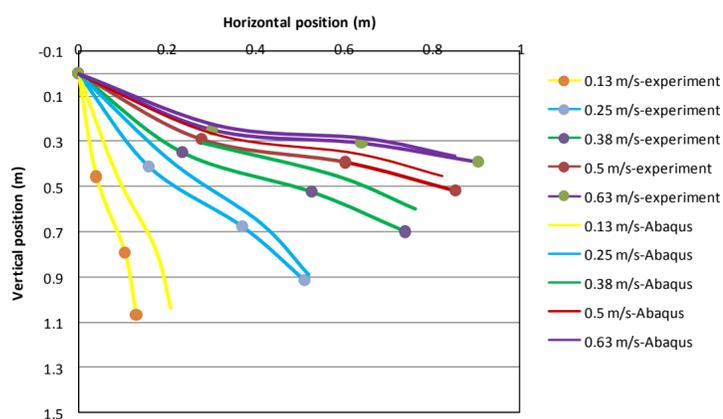
Deformation of net panel

Flow speed [m/s]	Drag force [N]
0	0.1345
0.13	2.6310
0.25	6.9224
0.38	11.8964
0.5	17.9918
0.63	25.6363



Von mises stress of net panel when subjected to different currents

### Comparison of deformation



Comparison between measured and the estimated deformation of PET net panel subjected to different currents.

## CONCLUSION

- The model was built in ABAQUS/Standard using Timoshenko beam element (B31) and the type of analysis was static, simulating the current as line load distributed over the net panel. In addition, the model is able to represent the rotation between the meshes (twisted vertical bar)
- As it was expected the deformation increase with increasing current forces.
- The result from ABAQUS agreed well with SINTEF experiment

## REFERENCES

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- Moe, H., Fredheim, A., Hopperstad, O.S., 2010. Structural analysis of aquaculture net cages in current. Journal of Fluids and Structures 26, 503-516.
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